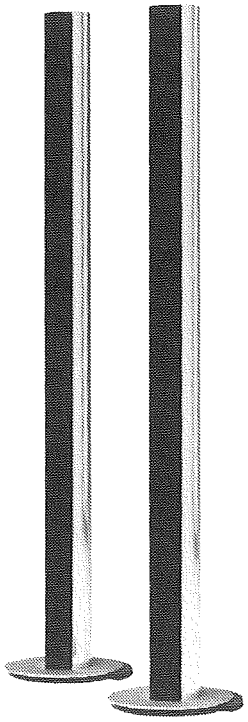
Bang&Olufsen

Beolab 6000

Type 6821, 6822, 6823
6824, 6825



SERVICE MANUAL

Circuit Description

3540160 Danish
3540161 English
3540162 German
3540163 French

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TECHNICAL SPECIFICATIONS	
Beolab 6000	Type 6821 (EU), 6822 (GB),
	6823 (USA-CDN), 6824 (JAP), 6825 (AUS)
System data:	
Frequency response	70-22,000 Hz +4-8 dB
	90-20,000 Hz ±2 dB
Sound Pressure Level	97 dB/IEC noise
	3 m/stereo/room
Input impedance	47 kΩ
Harmonic distortion	<2% 94 dB SPL/1 m/250-1000 Hz
	<1% 94 dB SPL/1 m/1000-5000 Hz
Electronics:	
Active crossover network	24 dB/octave, Linkwitz/Riley
High pass filter	30 dB/octave, 70 Hz
Low frequency equalization	65-250 Hz/+11 dB
Acoustics and cabinet:	
Cabinet principle	Bass Reflex
Woofer	2 unit 9 cm
Tweeter	1.8 cm
Crossover frequency	3000 Hz
Net. volume	3 litres
Power amplifier:	
Frequency range	40-20,000 Hz +0-1 dB
Signal to noise ratio	>95 dB A-weighted, max. power
Input sensitivity/impedance:	
Power Link sockets	1 V/47 kΩ
Power Link channel separation	>55 dB/10,000 Hz
Standby function	Automatic ON-OFF
Connections:	
Power Link	8-pin socket
Line	Phono socket
Power supply	230 Volts (6821), 240 Volts (6822), 120 Volts (6823)
	100 Volts (6824), 240 Volts (6825)
Power consumption	<110 Watts
Stand by	<2 Watts
Finish	Polished aluminium, black base, black front cloth
Total dimensions W x H x D	10 x 110 x 8 cm
Weight	6,2 kg
Subject to change without notice	

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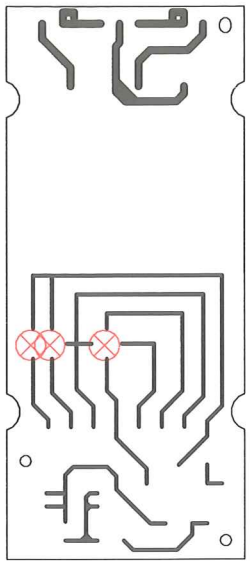
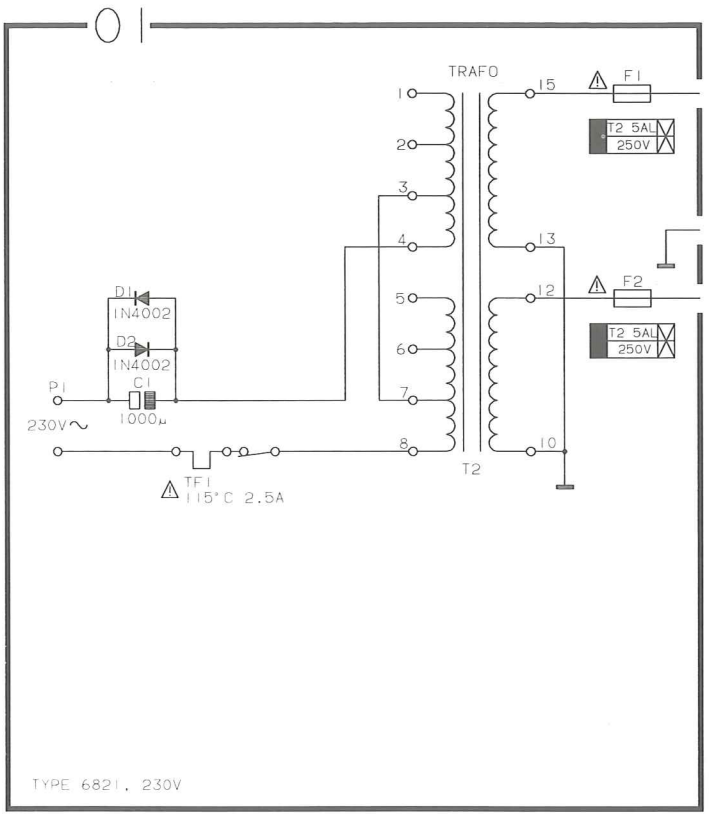
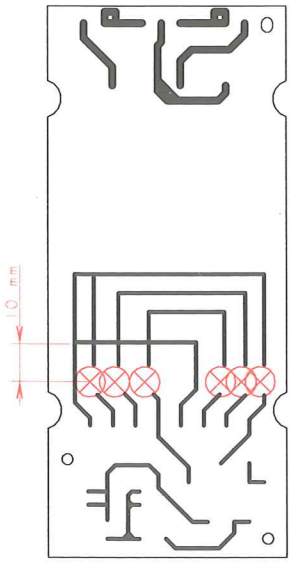
WIRING OF TRANSFORMER
Type 6821
EU 230 V~



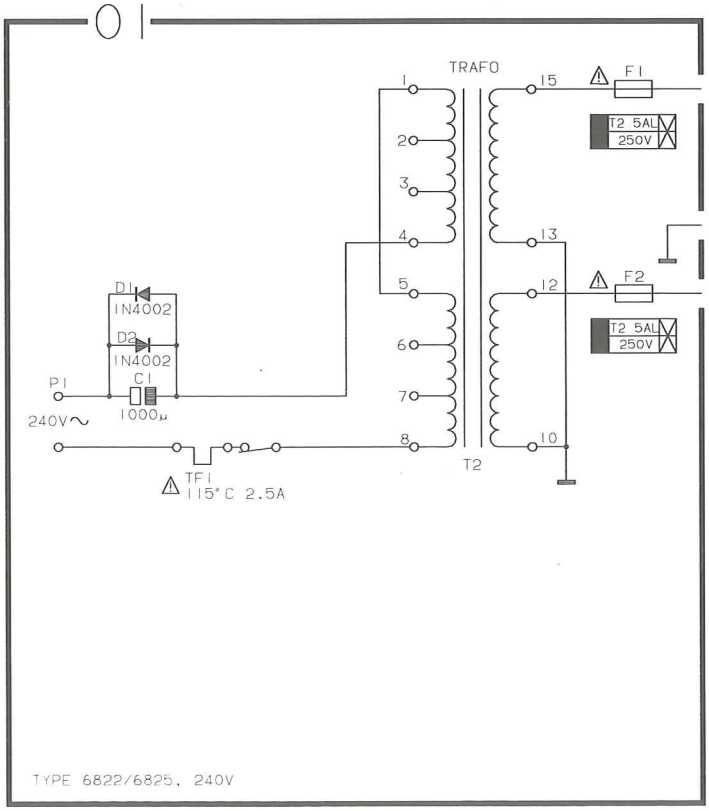
230V - TYPE 6821



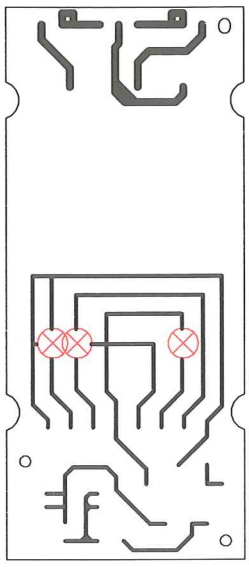
Type 6822, 6825
GB, AUS 240 V~



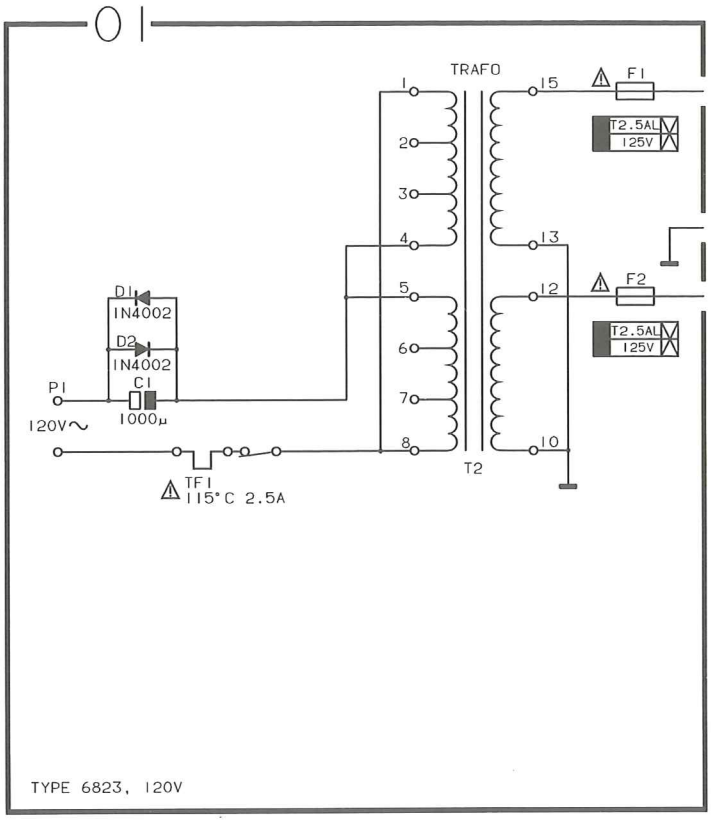
240V - TYPE 6822/6825



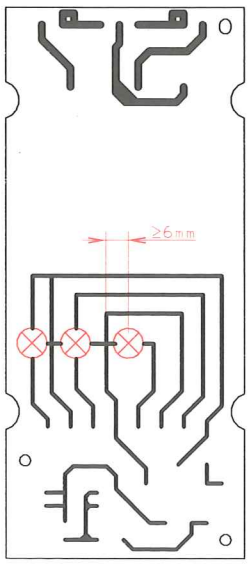
Type 6823
USA 120 V~



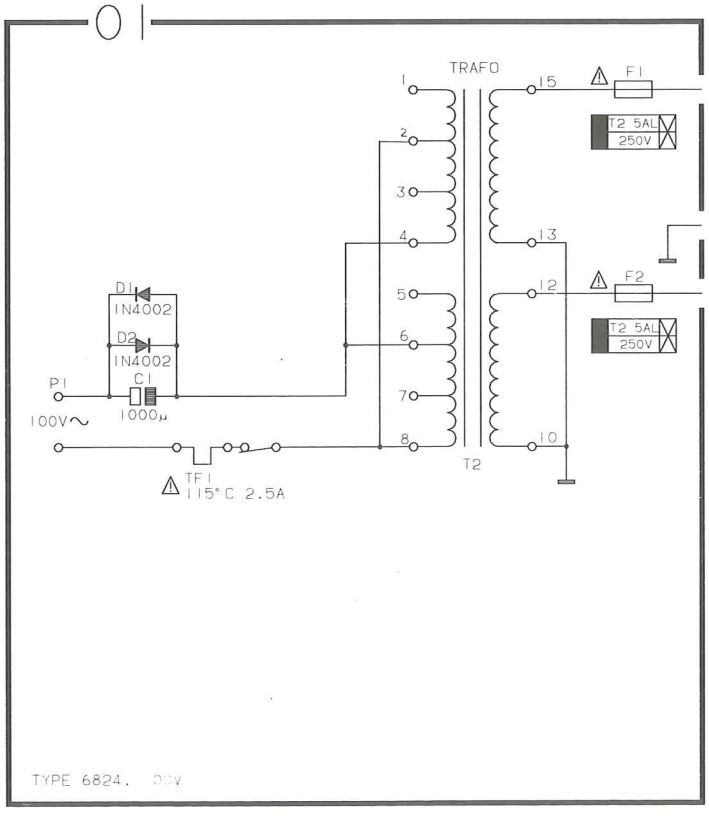
120V - TYPE 6823



Type 6824
JPN 100 V~



100V - TYPE 6824



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EXPLANATION OF DIAGRAM

Type numbers of transistors and ICs are indicated on the diagrams. If the position number is followed by an asterisk the spare part number must always be used because the component in question has been specially selected, e.g. TR102*.

Control Ciruit

In certain control circuits the active mode is indicated by a function term or by an abbreviation. This may be e.g. $\overline{\text{ST.BY.}}$ = low in the stand-by mode or ST.BY. = high in the stand-by mode.

Supply Voltages

All supply voltages in the diagrams are indicated by an arrow and a voltage indication.

Example:
"7 CON.". This means that the supply voltage in question goes to 7 different places on the diagram page inquestion (7 CON = 7 connections).

SYMBOL OF SAFETY COMPONENTS

When replacing components with this symbol, components with identical part numbers must be used. The new component must be mounted in the same way as the one replaced.

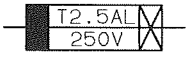
MEASURING CONDITIONS

All DC voltages have been measured in relation to ground with a voltmeter with an input resistance of 10 Mohms.

The DC voltages are stated in volts (V), e.g. 0.7 V.

EXPLANATION OF THE FUSE SYMBOLS USED IN THE SET

Replace with the same type of 2.5 amperes 250 volts (125 volts, type 6823) slow acting fuse.



EXPLANATION DE SYMBOLES DU FUSIBLE UTILISES DANS L'APPAREIL

Remplacer par un fusible retardé de la même type et de 2.5 ampères 250 volts (125 volts, type 6823).

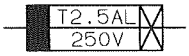


DIAGRAM A

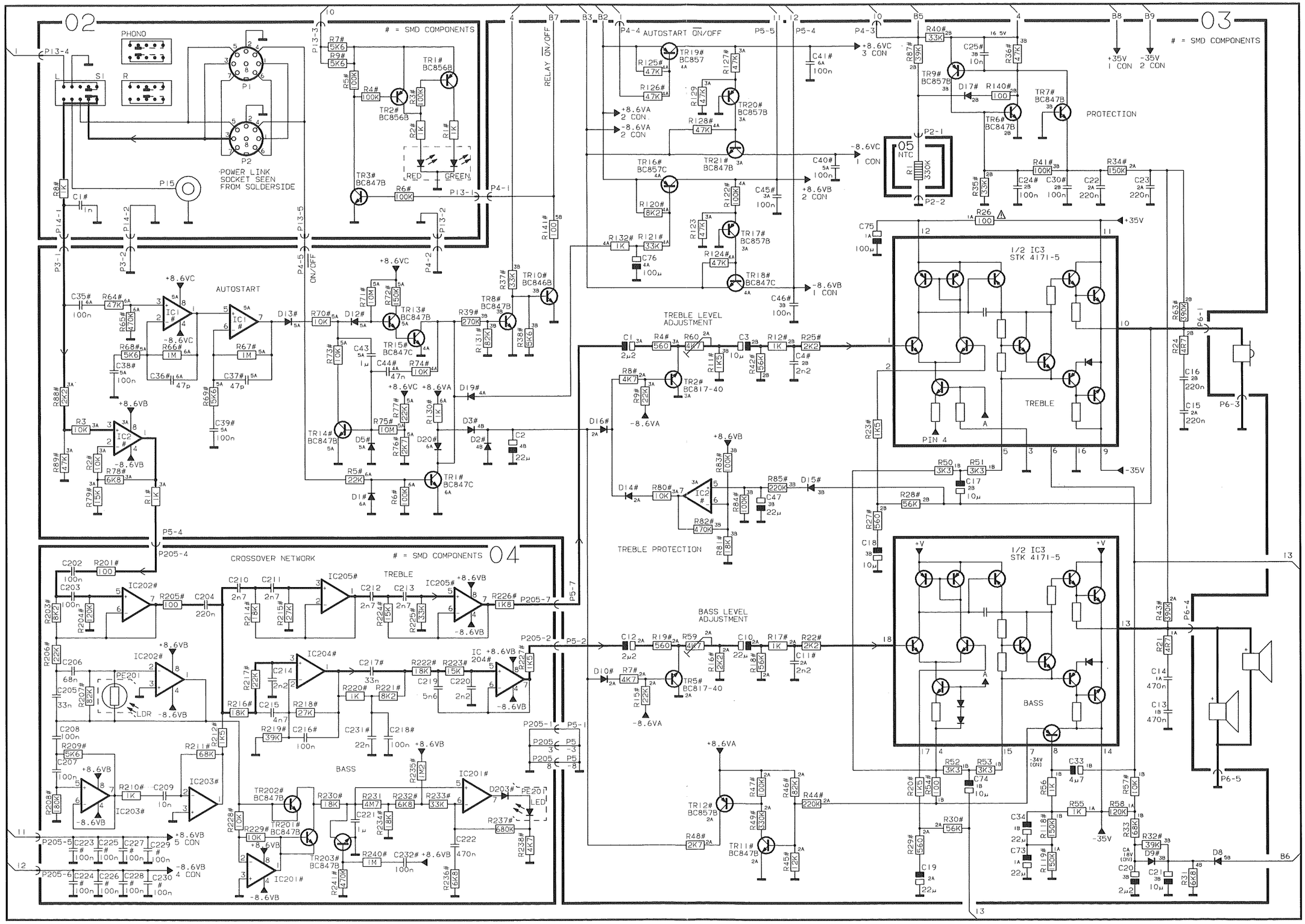
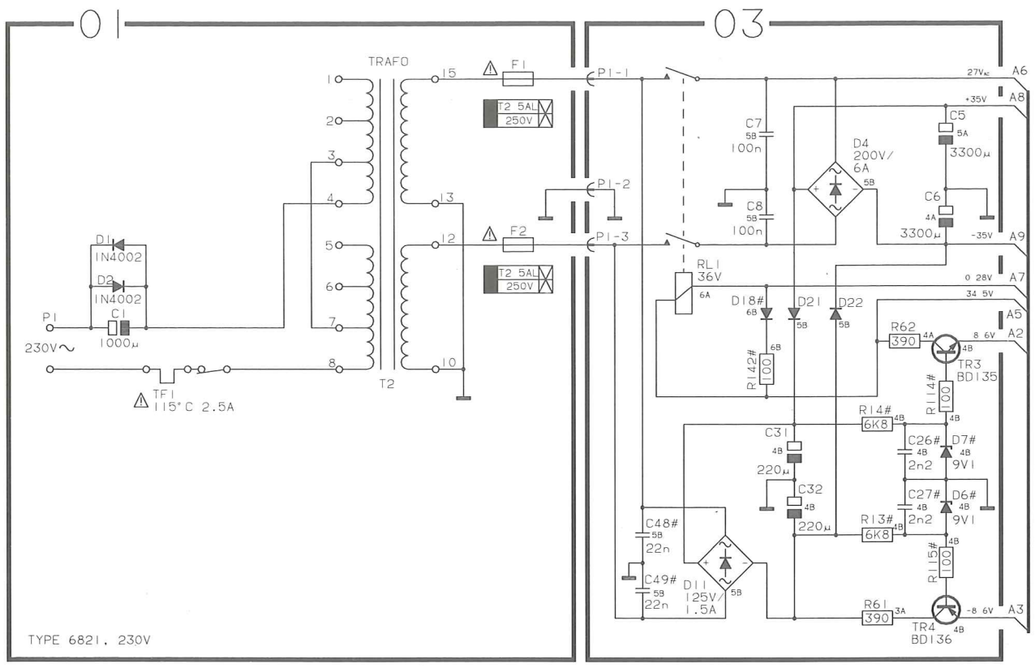

02
PHONO
P13-4
L
SI
R
P1
P2
POWER LINK SOCKET SEEN FROM SOLDERSIDE
P15
R8# 1K
C1# 1n
P14-1
P3-1
P14-2
P3-2
P13-3
P4-5
ON/OFF
P13-5
= SMD COMPONENTS
R7# 5K6
R9# 5K6
R5# 100K
R4# 100K
TR1# BC856B
R3# 100K
TR2# BC856B
R2# 1K
R1# 1K
RED
GREEN
TR3# BC847B
R6# 100K
P13-1
P4-1
P13-2
P4-2
RELAY ON/OFF
R141# 100
P4-4 AUTOSTART ON/OFF
P5-5
P5-4
TR19# BC857
R125# 4K7
R126# 4K7
R127# 4K7
R129 4K7
TR20# BC857B
R128# 4K7
+8.6VA 2 CON
-8.6VA 2 CON
TR16# BC857C
TR21# BC847B
R120# 8K2
R122# 100K
R123 4K7
TR17# BC857B
R124# 4K7
TR18# BC847C
R132# 1K
R121# 33K
C76 100µ
C45# 100n
C40# 100n
C41# 100n
C46# 100n
+8.6VC 3 CON
-8.6VC 1 CON
+8.6VB 2 CON
-8.6VB 1 CON
P4-3
B5
B8
B9
+35V 1 CON
-35V 2 CON
03
= SMD COMPONENTS
R40# 33K
C25# 10n
R36# 47K
TR9# BC857B
D17# R140# 100
TR7# BC847B
TR6# BC847B
PROTECTION
05 NTC
R1 330K
P2-1
P2-2
R41# 100K
R34# 150K
R35# 33K
C24# 100n
C30# 100n
C22 220n
C23 220n
R26 100
+35V
C75 100µ
1/2 IC3 STK 4171-5
TREBLE
PIN 4
R63# 690K
P6-1
R24 4K7
C16 220n
C15 220n
P6-3
R23# 1K5
R50 3K3
R51 3K3
C17 10µ
-35V
R28# 56K
R27# 560
C18 10µ
+8.6VC
C35# 100n
R64# 47K
R65# 470K
AUTOSTART
IC1#
D13#
-8.6VC
R66# 1M
R68# 5K6
C38# 100n
C36# 47p
R67# 1M
C37# 47p
R69# 5K6
C39# 100n
R88# 2K2
+8.6VB
R3 10K
IC2#
-8.6VB
R78# 6K8
R89# 47K
R2# 10K
R79# 15K
R1# 1K
P5-4
P205-4
CROSSOVER NETWORK
= SMD COMPONENTS
04
C202 100n
R201# 100
C203 100n
IC202#
R205# 100
C204 220n
R203# 8K2
R204# 120K
C210 2n7
C211 2n7
IC205#
TREBLE
C212 2n7
C213 2n7
R214# 18K
R215# 27K
R224# 15K
R225# 33K
R226# 1K8
P205-7
P5-7
R206# 22K
C206 68n
C205 33n
PE201
LDR
R207# 82K
IC204#
C214 2n2
C217# 33n
R222# 18K
R223# 15K
C219 5n6
C220 2n2
R227# 1K5
R217# 22K
R216# 18K
C215 4n7
R218# 27K
R220# 1K
R221# 8K2
R219# 39K
C216# 100n
C231# 22n
C218# 100n
P205-2
P5-2
C208 100n
R209# 5K6
C207 100n
R211# 68K
R212# 1K5
R210# 1K
C209 10n
IC203#
R208# 80K
BASS
R235# 1M2
IC201#
TR202# BC847B
TR201# BC847B
TR203# BC847B
R230# 18K
R231 4M7
R232# 6K8
R233# 33K
C221# 1µ
R234# 8K2
R240# 1M
C232# 100n
R241# 470K
R229# 10K
R236# 6K8
C222 470n
D203# PE202 LED
R237# 680K
R238# 4K7
P205-1
P5-1
P205-5
C223 100n
C225 100n
C227 100n
C229 100n
5 CON
P205-6
C224 100n
C226 100n
C228 100n
C230 100n
4 CON
C1 2µ2
R4# 560
R60 4K7
C3 10µ
R12# 1K
R25# 2K2
C4# 2n2
R11# 1K5
R42# 56K
TR2# BC817-40
R8# 4K7
R9# 22K
TREBLE LEVEL ADJUSTMENT
D16#
D19#
D3#
D2#
C2 22µ
D5#
D20#
TR14# BC847B
TR1# BC847C
R5# 22K
R6# 100K
D1#
R77# 22K
R75# 10M
R76# 2K7
R130# 1K
R71# 10M
R72# 150K
TR13# BC847B
R70# 10K
D12#
R73# 10K
C43 1µ
C44# 47n
R74# 10K
TR15# BC847C
R39# 270K
R131# 82K
R37# 33K
TR10# BC846B
TR8# BC847B
R38# 5K6
R83# 100K
D14# R80# 10K
IC2#
R84# 100K
R85# 220K
D15#
C47 22µ
R82# 470K
R81# 18K
TREBLE PROTECTION
C12 2µ2
R19# 560
R59 4K7
C10 22µ
R17# 1K
R22# 2K2
C11# 2n2
D10# R7# 4K7
TR5# BC817-40
R15# 22K
R16# 2K2
R18# 56K
BASS LEVEL ADJUSTMENT
+8.6VA
TR12# BC857B
TR11# BC847B
R47# 100K
R49# 330K
R46# 82K
R44# 220K
R48# 2K7
R45# 12K
R20# 1K5
R54# 100
R52 3K3
R53 3K3
C74 10µ
R29# 560
C19 22µ
R30# 56K
C33 4µ7
R56 1K
R55 1K
C34 22µ
R118# 150K
C73 22µ
R119# 150K
R57# 10K
R58 20K
R33 68K
R32# 39K
D9#
C20 2µ2
C21 10µ
D8
R31 6K8
R43# 390K
P6-4
R21 4R7
C14 470n
C13 470n
P6-5
B6
1/2 IC3 STK 4171-5
BASS

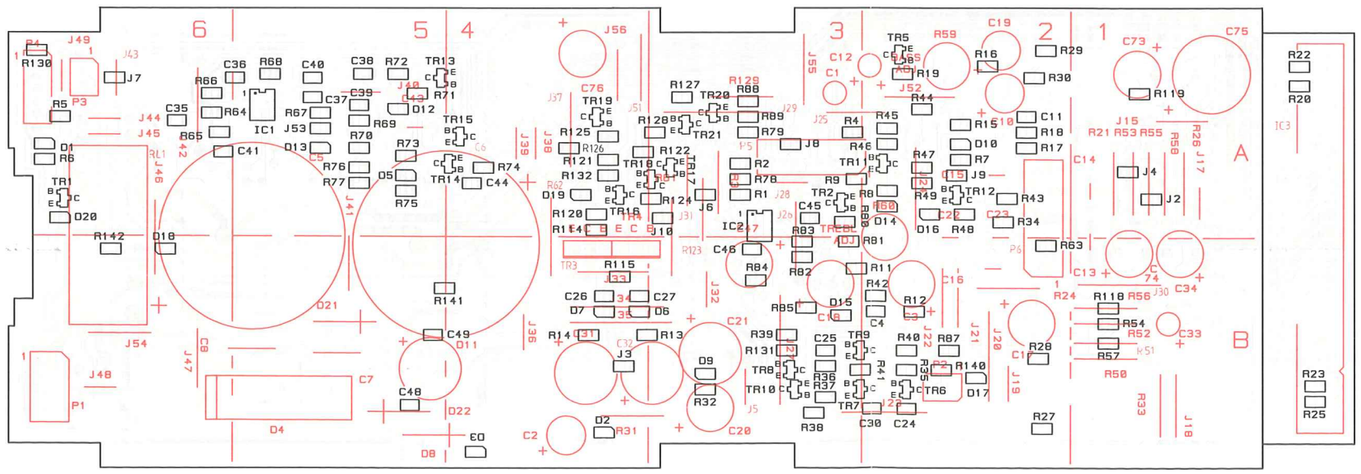
DIAGRAM B



SMD Survey

: rear side

PCB3, Main board



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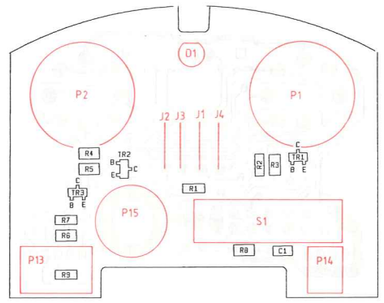
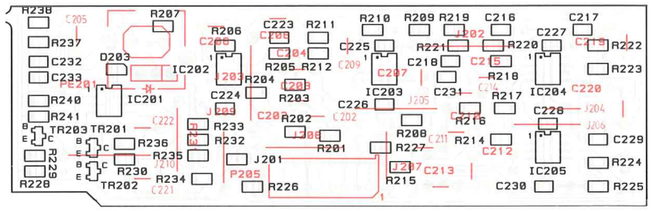
PCB2, Power Link



PCB4, Crossover and ABL



2 - 3a
DIAGRAM AND PCB DRAWING

2 - 3a

PCB 6, Crossover network and ABL, from serial no. 12764542

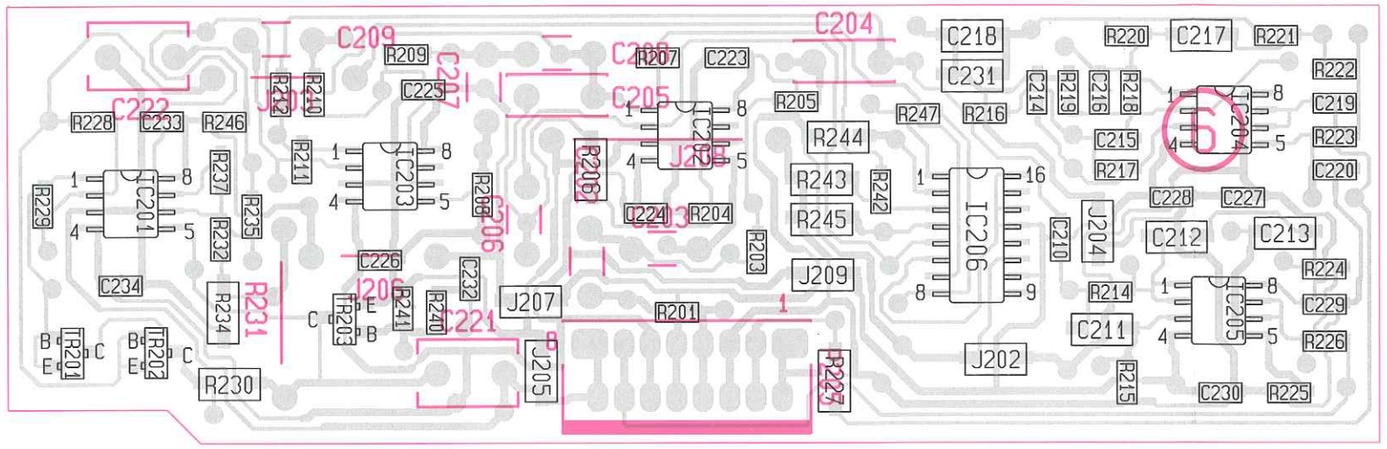
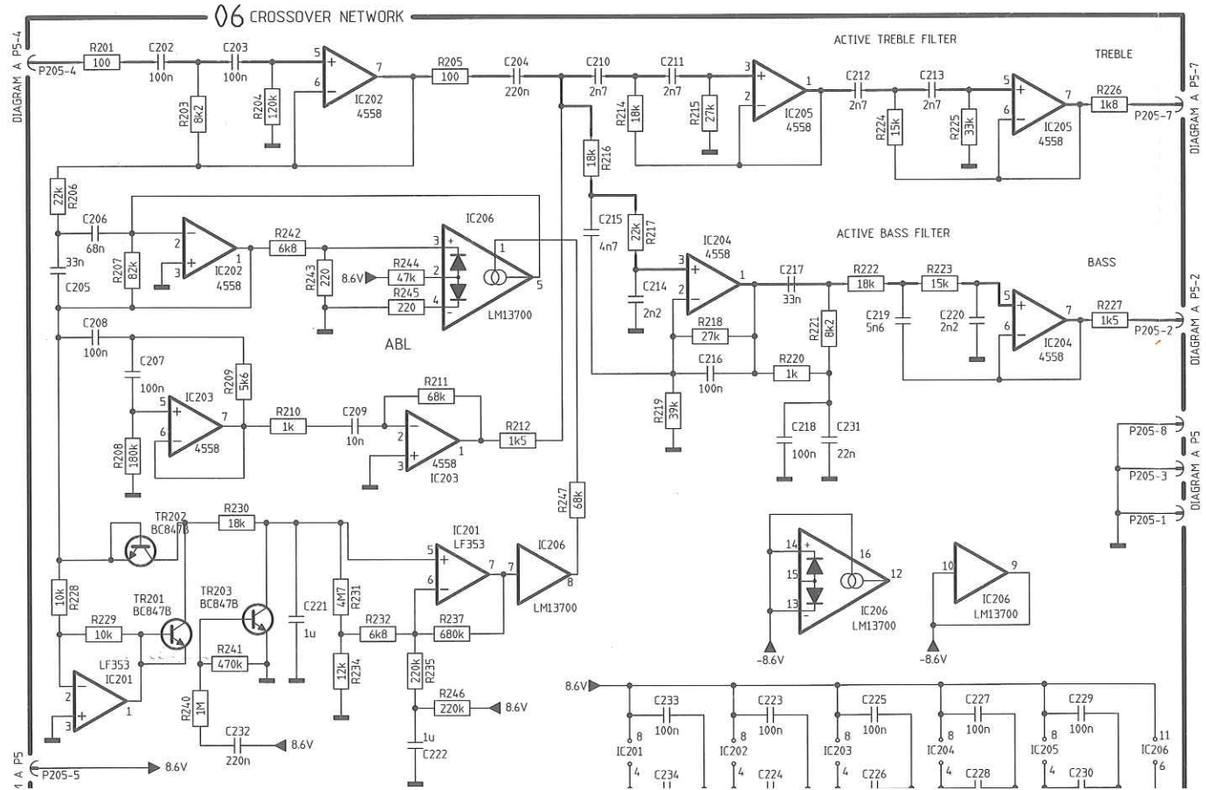
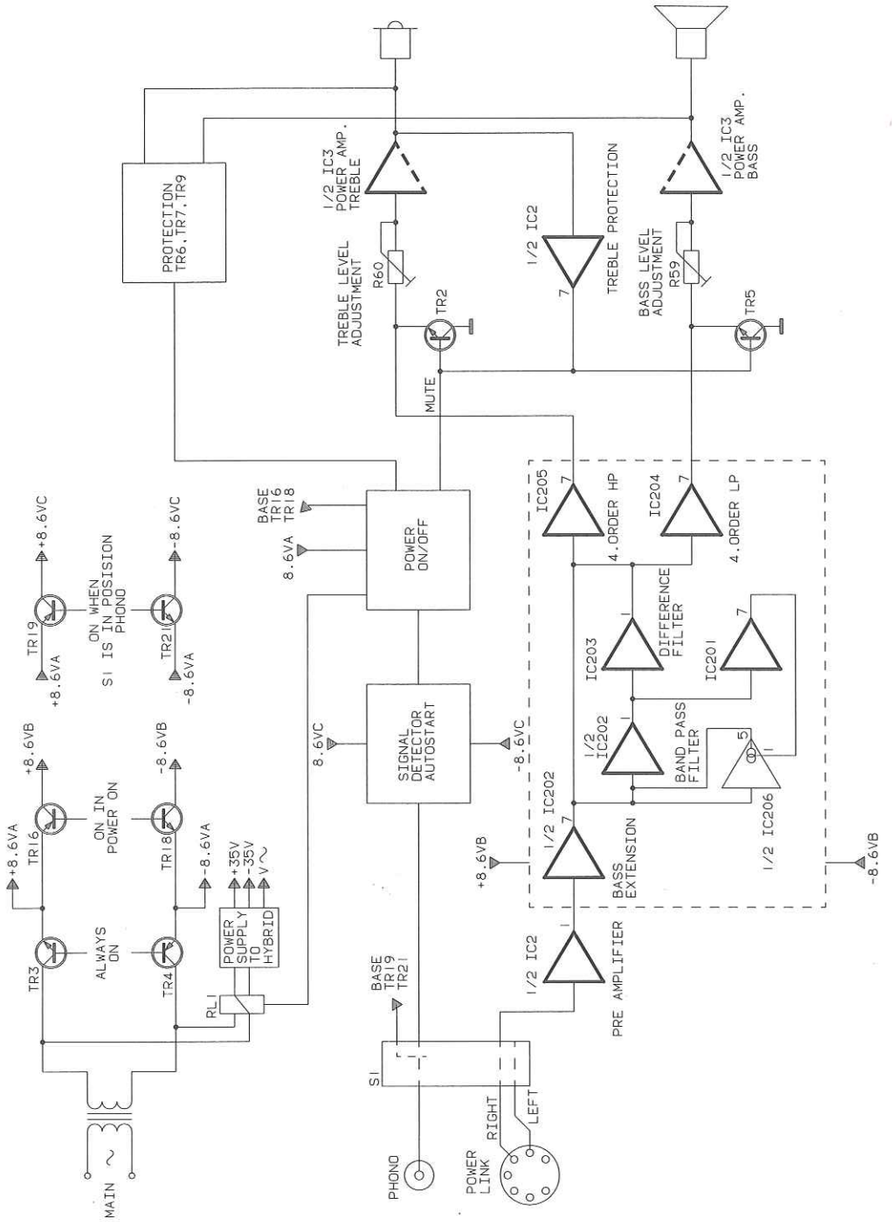


DIAGRAM C CROSSOVER NETWORK AND ABL, FROM SERIAL NO. 12764542

DIAGRAM A P5-4 11-97 Paste into Service Manual Loudspeaker (3538816) on page 2-4

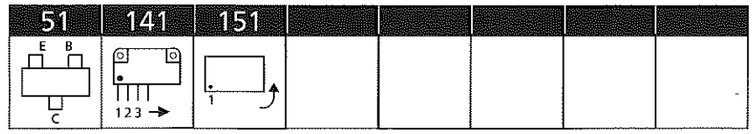


BLOCK DIAGRAM



2 - 3b
LIST OF ELECTRICAL PARTS

LIST OF ELECTRICAL PARTS



Resistors not referred to are standard, see page 3-4
Δ indicates that static electricity may destroy the component
** Specially selected or adapted sample*

PCB 6, 8006076, Crossover network and ABL

IC201Δ	8341033	**151**	LF353	IC206Δ	8341411	**151**	LM13700
IC202-IC205Δ	8341022	**151**	4558				
TR201-TR203	8320755	**051**	BC847B				

R201	5011932	100Ω 5% 1/10W	
R203	5011955	8.2kΩ 5% 1/10W	
R204	5011969	120kΩ 5% 1/10W	
R205	5011932	100Ω 5% 1/10W	
R207	5011967	82kΩ 5% 1/10W	
R208	5011971	180kΩ 5% 1/10W	
R209	5011953	5.6kΩ 5% 1/10W	
R210	5011944	1kΩ 5% 1/10W	
R211	5011966	68kΩ 5% 1/10W	
R212	5011946	1.5kΩ 5% 1/10W	
R214	5011959	18kΩ 5% 1/10W	
R215	5011961	27kΩ 5% 1/10W	
R216	5011959	18kΩ 5% 1/10W	
R217	5011960	22kΩ 5% 1/10W	
R218	5011961	27kΩ 5% 1/10W	
R219	5011963	39kΩ 5% 1/10W	
R220	5011944	1kΩ 5% 1/10W	
R221	5011955	8.2kΩ 5% 1/10W	
R222	5011959	18kΩ 5% 1/10W	
R223-R224	5011958	15kΩ 5% 1/10W	
R225	5011962	33kΩ 5% 1/10W	
R226	5011947	1.8kΩ 5% 1/10W	
R228-R229	5011956	10kΩ 5% 1/10W	
R231	5010770	4M7Ω 1% 1/2W	
R232	5011954	6.8kΩ 5% 1/10W	
R235	5011972	220kΩ 5% 1/10W	
R237	5011978	680kΩ 5% 1/10W	
R240	5011980	1MΩ 5% 1/10W	
R241	5011976	470kΩ 5% 1/10W	
R242	5011954	6.8kΩ 5% 1/10W	
R246	5011972	220kΩ 5% 1/10W	
R247	5011966	68kΩ 5% 1/10W	

C202-C203	4130306	100µF 10% 63V	
C204	4130308	220nF 10% 63V	
C205	4130305	33nF 10% 63V	
C206	4130231	68nF 10% 63V	
C207-C208	4130306	100nF 10% 63V	
C209	4130265	10nF 10% 63V	
C210	4001148	2.7nF 5% 50V	
C211-C213	4010195	2.7nF 5% 50V	
C214	4000442	2.2nF 5% 50V	
C215	4011050	4.7nF 5% 50V	
C216	4010274	100nF -20+80% 25V	
C217	4010175	33nF 10% 50V	
C218	4010220	100nF 10% 50V	
C219	4001091	5.6nF 5% 50V	
C220	4000442	2.2nF 5% 50V	
C221-C222	4130070	1µF 10% 50V	
C223-C230	4010274	100nF -20+80% 25V	
C231	4010216	22nF 10% 100V	
C232	4000287	220nF -20+80% 25V	
C233-C234	4010274	100nF -20+80% 25V	

P205	7210768	Socket 8 pole

2 - 3b
CORRECTIONS

CORRECTIONS

List of electrical parts page 3-2

PCB 3, 8006077 Mainboard

IC3	8350091	**141**	Hybrid STK4172-2

R21	5010765	4.7Ω 1% 1/2W
R24	5010765	4.7Ω 1% 1/2W
R31	5011042	6.8kΩ 1% 1/2W
R50-R53	5011037	3.3kΩ 1% 1/2W
R55-R56	5011028	1kW 1% 1/2W
R61-R62	5021605	470W 5% 1W
R81	5011272	10kΩ 5% 1/8W
R82	5011208	220kΩ 5% 1/8W
R85	5011198	150kΩ 5% 1/8W

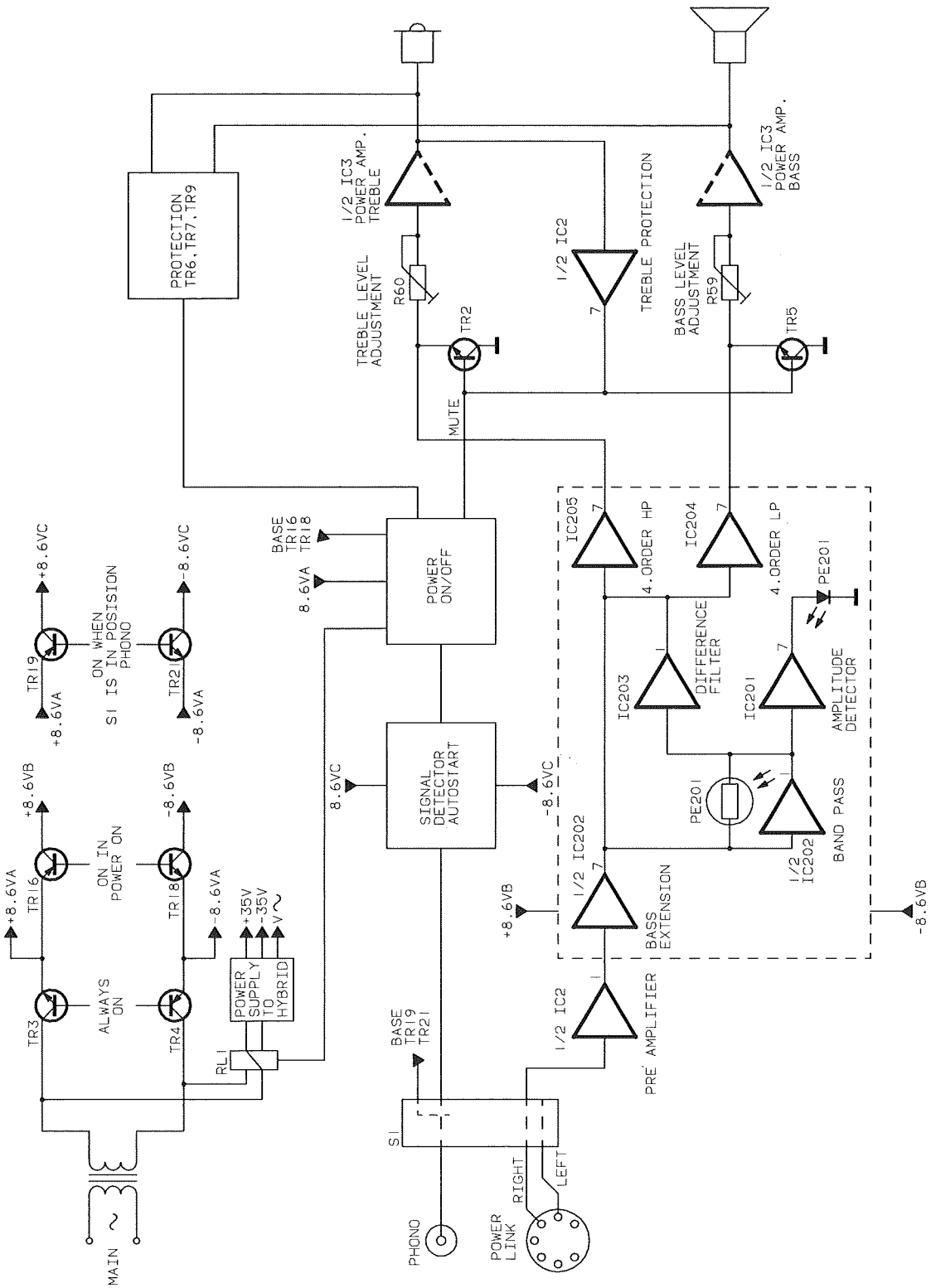
C9	4000345	1.0nF 5% 50V
C28	4200517	2.2µF 20% 50V
C47	4200688	47µF 20% 50V
C75	4201309	100µF 20% 63V

List of mechanical parts page 4-2

Parts not shown

6100328	Mains cable, type 6822
6276720	Wire, 1P1-Main socket

BLOCK DIAGRAM



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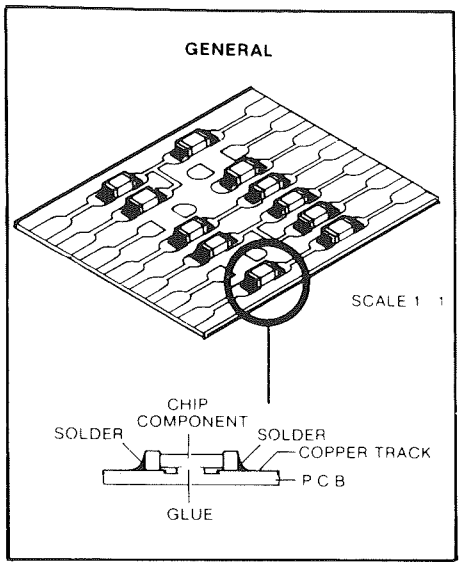
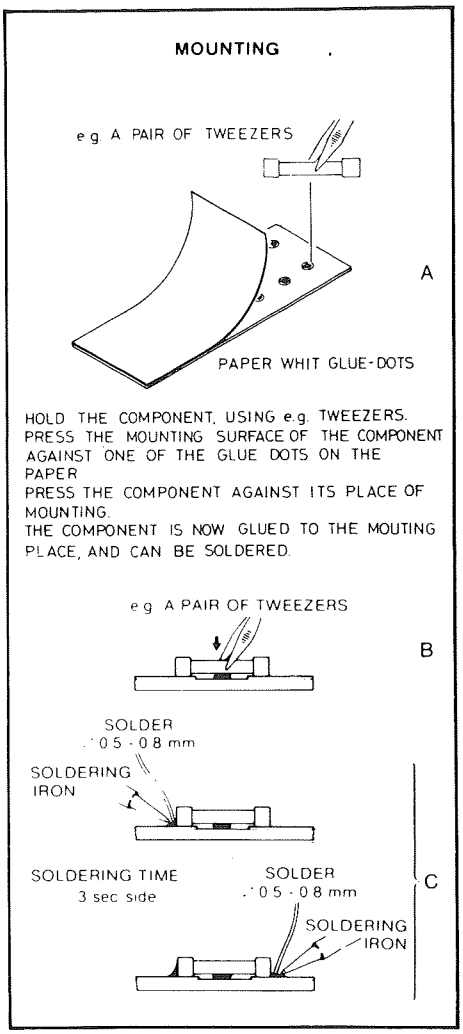
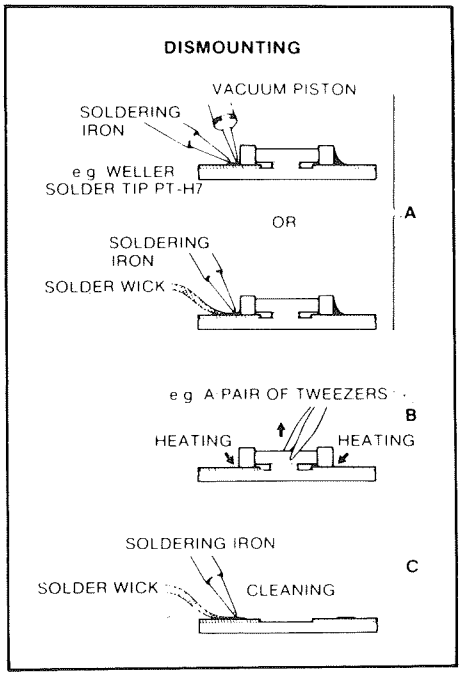
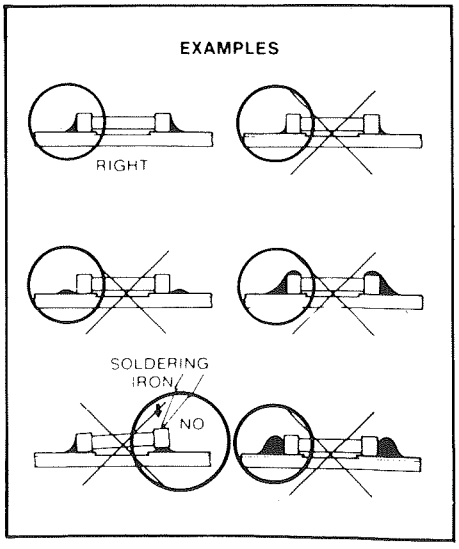
LIST OF ELECTRICAL PARTS

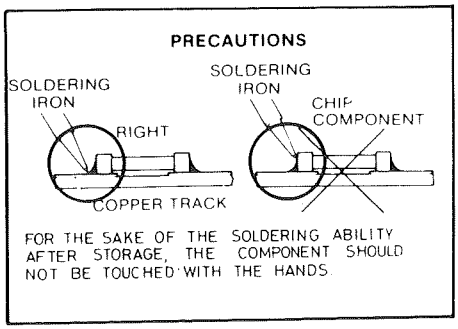
In the player chip components have been applied. For insertion and removal of chip components see the figure below.




MOUNTING
e.g. A PAIR OF TWEEZERS
A
PAPER WHIT GLUE-DOTS
HOLD THE COMPONENT, USING e.g. TWEEZERS.
PRESS THE MOUNTING SURFACE OF THE COMPONENT AGAINST ONE OF THE GLUE DOTS ON THE PAPER
PRESS THE COMPONENT AGAINST ITS PLACE OF MOUNTING.
THE COMPONENT IS NOW GLUED TO THE MOUTING PLACE, AND CAN BE SOLDERED.
e.g. A PAIR OF TWEEZERS
B
SOLDER .05 - 0.8 mm
SOLDERING IRON
SOLDERING TIME 3 sec side
SOLDER .05 - 0.8 mm
SOLDERING IRON
C






PRECAUTIONS
SOLDERING IRON
RIGHT
SOLDERING IRON
CHIP COMPONENT
COPPER TRACK
FOR THE SAKE OF THE SOLDERING ABILITY AFTER STORAGE, THE COMPONENT SHOULD NOT BE TOUCHED WITH THE HANDS.

32	51	136	138	141	209	250	255

Resistors not referred to are standard, see page 3-4

△ *indicates that static electricity may destroy the component.*

* *Specially selected or adapted sample.*

PCB 01, 8006045
Transformer

D1-D2	8300023	**209**	1N 4002				
C1	4200821		1000µF -20+50% 6.3V				
F1-F2	6600067		Fuse T2.5A, 250V	F1-F2	6600081		Fuse T2.5A, 125V type 6823
	7200064		Fuse holder	TF1	6609040		Termo 2.5A
P1	7220406		Plug 2 pole				

PCB 02, 8006071
Power Link

TR1-TR3	8320753	**051**	BC856B				
D1	8330236	**255**	Bicolor				
R1-R2	5011631		1kΩ 1% 1/4W	R7	5021382		5.6kΩ 1% 1/4W
				R9	5021382		5.6kΩ 1% 1/4W
C1	4000345		1 nF 5% 50V				
S1	7400371		Switch				
P1-P2	7210929		DIN-Socket 8 pole	P14	7220724		Plug 2 pole
				P15	7210567		Socket, Phono
	2011043		Screw, 2.2x6		2625028		Washer
P13	7220727		Plug 5 pole				

PCB 03, 8006077
Mainboard

IC1-IC2△	8341022	**138**	4558	IC3△	8350085	**141**	Hybrid STK4171-V
TR1	8320936	**051**	BC847C	TR12	8320811	**051**	BC857B
TR2	8320752	**051**	BC817-40	TR13-TR14	8320755	**051**	BC847B
TR3*	8320239	**032**	BD135				
TR4*	8320240	**032**	BD136	TR15	8320936	**051**	BC847C
TR5	8320752	**051**	BC817-40	TR16	8320778	**051**	BC858C
TR6-TR8	8320755	**051**	BC847B	TR17	8320811	**051**	BC857B
				TR18	8320936	**051**	BC847C
TR9	8320811	**051**	BC857B	TR19-TR20	8320811	**051**	BC857B
TR10	8320816	**051**	BC846B				
TR11	8320755	**051**	BC847B	TR21	8320755	**051**	BC847B
D1-D3	8300482	**250**	LL4148	D9-D10	8300482	**250**	LL4148
D4	8300497		KBU 6D	D11	8300466		125V 1.5A
D5	8300482	**250**	LL4148	D12-D20	8300482	**250**	LL4148
D6-D7	8300762	**250**	Z9.1V 2%				
				D21-D22	8300023	**209**	1N 4002
D8	8300023	**209**	1N 4002				

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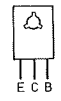
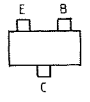
32	51	136	138	141	209	250	255
							

Resistors not referred to are standard, see page 3-4

△ *indicates that static electricity may destroy the component.*

** Specially selected or adapted sample.*

R13-R14	5012192	6.8kΩ 5% 1/4W	R59-R60	5370370	4.7kΩ 30% 0.1W
R26	5020159	100Ω 10% 0.3W	R130	5011631	1kΩ 1% 1/4W

C1	4200517	2.2µF 20% 50V	C30	4010166	100nF -20+80% 50V
C2	4200672	22µF 20% 16V	C31-C32	4200858	220µF 20% 50V
C3	4200510	10µF 20% 16V			
C4	4010170	2.2nF 10% 50V	C33	4200875	4.7µF 20% 100V
C5-C6	4201139	3300µF 20% 50V	C34	4200508	22µF 20% 25V
			C35	4010220	100nF 10% 50V
C7-C8	4130103	100nF 20% 250V	C36-C37	4000234	47pF 5% 50V
C10	4200525	22µF 20% 10V	C38-C39	4010220	100nF 10% 50V
C11	4010170	2.2nF 10% 50V			
C12	4200517	2.2µF 20% 16V	C40-C41	4010166	100nF -20+80% 50V
C13-C14	4130234	470nF 10% 63V	C43	4130070	1µF 10% 50V
C15-C16	4130233	220nF 20% 63V	C44	4010209	47nF 10% 50V
			C45-C46	4010166	100nF -20+80% 50V
C17	4200561	10µF 20% 50V			
C18	4200510	10µF 20% 16V	C47	4200508	22µF 20% 25V
C19	4200525	22µF 20% 10V	C48-C49	4010216	22nF 10% 100V
C20	4200517	2.2µF 20% 50V			
C21	4200874	10µF 20% 100V	C73	4200508	22µF 20% 25V
C22-C23	4130233	220nF 20% 63V	C74	4200561	10µF 20% 50V
			C75	4200368	100µF.20% 63V
C24	4010166	100nF -20+80% 50V	C76	4200628	100µF 20% 16V
C25	4010176	10nF -20+80% 50V			
C26-C27	4010170	2.2nF 10% 50V			

RL1	7600110	Relay 36V

P1	7220185	Plug 3 pole	P4	7220712	Plug 5 pole
P2-P3	7220709	Plug 2 pole	P5	7220788	Plug 8 pole
			P6	7220206	Plug 5/4 pole

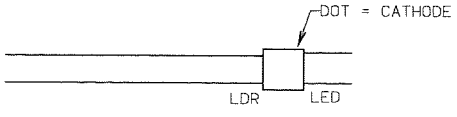
PCB 04, 8006076
Crossover and ABL

IC201△ IC202-IC205△	8341033	**136**	LF353-TL072
	8341022	**138**	4558

TR201-TR203	8320755	**051**	BC847B

D203	8300482	**250**	LL4148

PE201	5210017	LDR/LED coupler



C202-	4130306	100nF 10% 63V	C216	4010220	100nF 10% 50V
C203			C217	4010175	33nF 10% 50V
C204	4130308	220nF 10% 63V	C218	4010220	100nF 10% 50V
C205	4130305	33nF 10% 63V	C219	4010183	5.6nF 10% 50V
C206	4130231	68nF 10% 63V	C220	4010103	2.2nF 10% 50V
C207-	4130306	100nF 10% 63V	C221	4130399	1µF 10% 63V
C208			C222	4130234	470nF 10% 63V
C209	4130265	10nF 10% 63V	C223-	4010166	100nF -20+80% 50V
C210-	4010167	2.7nF 10% 100V	C230		
C213			C231	4010216	22nF 10% 100V
C214	4010103	2.2nF 10% 50V	C232	4130233	220nF 20% 63V
C215	4010101	4.7nF 10% 50V			

P205	7210768	Socket 8 pole

PCB 05, 8006078
NTC

R1	5220036	330kΩ 10% 1/2W

3-4
LIST OF ELECTRICAL PARTS

Standard Resistors:

Resistors SMD 2% 1/8 W
SMD 5% 1/8 W

	5%	2%	2%	2%	2%	2%	5%	5%
	x1	**x10**	**x100**	**x1K**	**x10K**	**x100K**	**x1M**	**x10M**
1.0	5011623	5011647	5011218	5011227	5011241	5011256	5011267	5011730
1.1	5011624	5011648	5011669	5011681	5011689	5011694	5011707	
1.2	5011625	5011649	5011219	5011682	5011490	5011257	5011708	
1.3	5011626	5011650	5011670	5011683	5011242	5011258	5011709	
1.5	5011627	5011651	5011220	5011228	5011243	5011259	5011710	
1.6	5011628	5011652	5011671	5011684	5011690	5011695	5011711	
1.8	5011629	5011653	5011672	5011229	5011244	5011260	5011712	
2.0	5011630	5011654	5011673	5011685	5011691	5011696	5011713	
2.2	5011216	5011655	5011674	5011230	5011245	5011261	5011714	
2.4	5011634	5011656	5011675	5011686	5011246	5011697	5011715	
2.7	5011635	5011657	5011497	5011231	5011247	5011262	5011716	
3.0	5011731	5011658	5011499	5011500	5011692	5011698	5011717	
3.3	5011217	5011659	5011676	5011232	5011248	5011263	5011718	
3.6	5011636	5011660	5011677	5011687	5011249	5011264	5011719	
3.9	5011637	5011661	5011221	5011233	5011491	5011699	5011720	
4.3	5011638	5011662	5011498	5011688	5011492	5011700	5011721	
4.7	5011639	5011269	5011222	5011234	5011250	5011265	5011722	
5.1	5011640	5011663	5011678	5011235	5011493	5011701	5011723	
5.6	5011641	5011664	5011223	5011236	5011251	5011702	5011724	
6.2	5011642	5011665	5011224	5011237	5011693	5011703	5011725	
6.8	5011643	5011666	5011225	5011238	5011252	5011704	5011726	
7.5	5011644	5011667	5011679	5011239	5011253	5011705	5011727	
8.2	5011645	5011270	5011226	5011240	5011254	5011266	5011728	
9.1	5011646	5011668	5011680	5011489	5011255	5011706	5011729	

(Glue dots, approx. 200, part no. 3181932).

Resistors 5% 1/2 W

	x1	**x10**	**x100**	**x1K**	**x10K**	**x100K**	**x1M**	**x10M**
1.0		5011000	5011013	5011028	5011044	5010313	5011069	5011083
1.2	5011406	5011001	5011014	5011030	5011045	5011058	5010421	
1.5	5010727	5011002	5011015	5011031	5011046	5011059	5011071	
1.8	5010857	5010787	5011016	5011033	5011047		5011072	
2.2	5011335	5010708	5010815	5011034	5011048	5011061	5011074	
2.7	5011612	5010803	5011018	5010055	5011049	5011062	5011075	
3.3	5010255	5011007	5011019	5011037		5011063	5010381	
3.9		5010782	5011021	5010700	5011051		5010392	
4.7	5010765	5011009	5011022	5010035	5010036	5011065	5011078	
5.6		5011010	5011023	5011041		5011066	5011079	
6.8	5010874	5011011	5011024	5011042	5010810	5011067	5011080	
8.2		5011012	5011026	5011043	5010038	5011068	5011081	

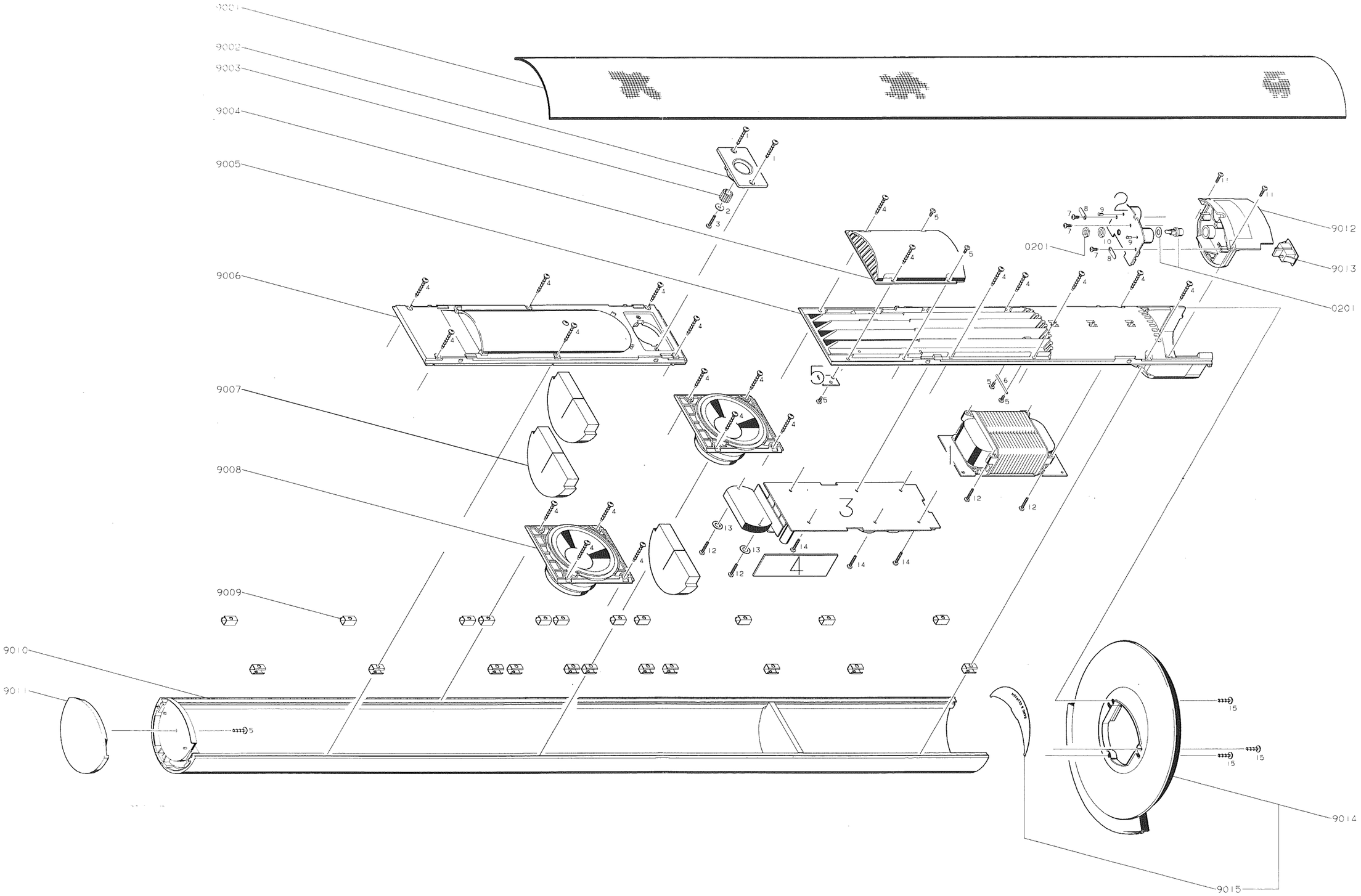
Resistors 5% 1/4 W

	x1	**x10**	**x100**	**x1K**	**x10K**	**x100K**	**x1M**	**x10M**
1.0	5010592	5010506	5010065	5010040	5010059	5010049	5010054	5010638
1.2		5010595	5010128	5010153	5010046	5010047	5010665	
1.5	5011348	5010468	5010057	5010247	5010053	5010063	5010093	
1.8		5010822	5010362	5010066	5010135	5010072	5010791	
2.2	5010682	5010448	5010092	5010064	5010079	5010120	5010245	
2.7	5010925	5010403	5010000	5010298	5010141	5010083	5010431	
3.3		5010253	5010044	5010076	5010075	5010117	5010848	
3.9	5011377	5010622	5010070	5010069	5010060	5010073	5010714	
4.7	5010888	5010411	5010058	5010048	5010045	5010077	5011513	
5.6	5010706	5010151	5010067	5010041	5010061	5010071	5010658	
6.8	5010904	5010039	5010144	5010052	5010062	5010074		
8.2	5010880	5010056	5010068	5010154	5010091	5010505		

Resistors 5% 1/8 W

	x1	**x10**	**x100**	**x1K**	**x10K**	**x100K**	**x1M**	**x10M**
1.0		5011464	5011357	5010816	5010935	5011440	5011459	5020875
1.2		5011351	5011084	5011442	5011338	5011341	5011175	
1.5		5011463	5011443	5011178	5011364	5011398	5011460	
1.8			5011350	5011361	5011344	5011468		
2.2	5011032	5011376	5010886	5011353	5010833	5011369	5011342	
2.7		5011471	5011355	5011362	5011366	5011370	5011478	
3.3		5011347	5011337	5010827	5011346	5011371	5011462	
3.9		5011438	5011817	5011157	5011457	5011372	5020876	
4.7	5011363	5011038	5011441	5011363	5010937	5011343	5011611	
5.6		5011412	5011358	5010885	5011166	5011340		
6.8		5011356	5011336	5010839	5011367	5011458		
8.2		5011466	5011354	5011339	5011368	5011373		

LIST OF MECHANICAL PARTS
Expl. view



01modul	8006045	PCB Transformer
02modul	8006071	PCB Power Link
0201	7210567	Socket, Phono
03modul	8006077	PCB Mainboard
04modul	8006076	PCB Crossover and ABL
05modul	8006078	PCB NTC

9001	3451029	Cloth front	9009	2816214	Clips
9002	8480243	Tweeter	9010	3430587	Cabinet
9003	3358305	Heat sink f. tweeter		3947350	Foam tape, 3x7 mm
9004	3164862	Cover		3947548	Foam tape, 6x7 mm
9005	3358304	Heat sink			
	3947547	Foam tape, 3x19 mm	9011	3458854	Top
			9012	3169024	Bracket
9006	3440165	Baffle w. port	9013	7219075	Socket f. mains cable
	3947350	Foam tape, 3x7 mm	9014	2752032	Foot
9007	3332046	Damper	9015	3302533	Foil with print
9008	8480248	Woofer			

Survey of screws and washers

1	2015139	Screw, 3.5x16	8	7530119	Soldertag
2	2039034	Screw, 3x12	9	2011043	Screw, 2.2x6
3	2622247	Washer, ø3.2x10.2x1	10	2625028	Washer
			11	2011055	Screw, 3x10
4	2015154	Screw, 3.5x25	12	2011056	Screw, 3x16
5	2013192	Screw, 3x6	13	2624013	Washer, ø3
6	3956009	Wire holder, ø2x29	14	2013188	Screw, 3x8
			15	2042067	Screw,4x16
7	2013144	Screw, 3x8			

Parts not shown

6100245	Mains cable, type 6821, 6822
6100268	Mains cable, type 6823
6100247	Mains cable, type 6824
6100248	Mains cable, type 6825
6276608	Wire, 1P1-Main socket
6276609	Wire, 2P14-3P3
6276610	Wire, 2P13-3P4
6276648	Wire, 3P2-5CP
6276649	Wire, 1CP-3P1
6276497	Wire bundle f. HT
6270599	Power Link cable, black, 5 m
2013192	Screw, f. adjustment
3332048	Damper
3040030	Hexagon spanner, 2.5 mm
3392274	Outer carton
3397857	Foam packing

Owners Manual

3506204	Danish
3506205	Swedish
3506206	Finnish
3506207	English
3506208	German
3506209	Dutch
3506210	French
3506211	Italien
3506212	Spanish

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ADJUSTMENT

Adjustment of the bass/treble level

When a speaker is replaced, the level has to be adjusted. A rated value, stated in dB, will be printed on the back of the new unit.

This value must be used in connection with the adjustment.

The speaker units need not be connected during the adjustment.

1. Connect an audio oscillator to either:

   - pin 5 (switch in position RIGHT) of the POWER LINK socket. The voltage at pin 4 should be +5V.
   - pin 3 (switch in position LEFT) of the POWER LINK socket. The voltage at pin 4 should be +5V.
   - the phono socket (switch in position PHONO).

   Signal levels
   When adjusting the tweeter, apply a signal of 10kHz – 100mV.

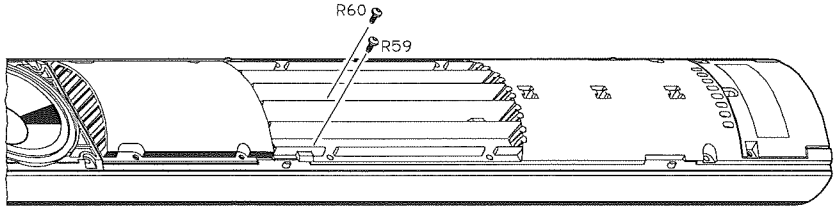
   When adjusting the woofer, apply a signal of 1kHz – 100mV.

2. Connect an AC voltmeter across the connection terminals of the replaced unit.

   Tweeter: P6-1 / P6-3

   Woofer: P6-4 / P6-5

3. Depending on the rated value stated on the new unit, adjust R60-PCB03 (tweeter) or R59-PCB03 (woofer).
   Access to R59 and R60 is gained by removing the screws – see illustration.



Adjustment of the treble level

When adjusting the treble level, adjust the voltage corresponding to the rated dB value.

Adjustment of the bass level

When adjusting one bass unit, adjust to half the rated value stated on the new unit.

- For example: If the rated value is -1.5 dB, adjust to the voltage that corresponds to -0.75 dB (3.27 V).

When adjusting two bass units, add the two rated values and divide by 2.

- For example: If the rated values are -1.5 dB and 2 dB respectively, that gives a total value of 0.5 dB, so adjust to the voltage that corresponds to a value of 0.25 dB (2.72 V).

Replacement of PCB03

When PCB03 is replaced, the level of the tweeter has to be adjusted to 3.00 V by means of R60-PCB03, and the level of the woofer has to be adjusted to 2.80 V by means of R59-PCB03.

Rated value in dB	Treble	Bass
2.00	2.38 V	2.22 V
1.75	2.45 V	2.29 V
1.50	2.52 V	2.36 V
1.25	2.60 V	2.42 V
1.00	2.67 V	2.50 V
0.75	2.75 V	2.57 V
0.50	2.83 V	2.64 V
0.25	2.91 V	2.72 V
0.00	3.00 V	2.80 V
-0.25	3.09 V	2.88 V
-0.50	3.18 V	2.97 V
-0.75	3.27 V	3.05 V
-1.00	3.37 V	3.14 V
-1.25	3.46 V	3.23 V
-1.50	3.53 V	3.33 V
-1.75	3.67 V	3.42 V
-2.00	3.78 V	3.52 V

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REPAIR TIPS

Important!

To avoid consequential damage, the electrolytic capacitors C5-PCB03 and C6-PCB03 have to be discharged with an output resistance of approx. 500 ohm before replacing components, because these electrolytic capacitors are discharged neither in stand-by nor when the mains voltage is disconnected. (The voltage is able to keep for up to a week.)

Power supply

The individual 8.6V supplies are active in different situations.

$\pm 8.6V_B$ is switched off in stand-by.

$\pm 8.6V_C$ is switched on only when the S1 switch is set to PHONO.

Autostart circuit

Approx. 0.8 seconds after a signal (approx. 100µV) is applied to the PHONO socket, the product will go into ON mode.

Unless the autostart circuit is switched off, the product will go into stand-by approx. 2 minutes after the signal applied to the PHONO socket has disappeared.

If it is desirable to switch off the autostart circuit during a repair, this can be achieved by short-circuiting C43-PCB03.

Protection circuit

The protection circuit, (TR6, TR7 and TR10) PCB03, can be checked by making the resistance between P2-1 and P2-2 (NTC resistance) <22 Kohm, which will make the product go into stand-by.
The product can only be brought out of this condition by removing the mains supply.

ABL (adaptive bass linearization)

The ABL function is most easily checked by connecting an audio oscillator (80 Hz) to the input socket.

Connect a DC voltmeter across R238-PCB04.

Adjust the level of the audio oscillator until the voltage across R238-PCB04 just begins to rise from 0V. The voltage must be between 0 and 30mV. This is just sufficient for making ABL active. (The output is approx. 11W.)

Now increase the level at the input by 10 dB.

The voltage across R238-PCB04 should now rise to approx. 2.2V immediately. (The output is approx. 24W.)

Reduce the level at the input by 10 dB.

After 5-10 seconds, the voltage across R238-PCB04 should drop to approx. 0V. ABL is out of operation.

Assembly of the product

Make sure that the leads from the Transformer/Power Link PCB to the Mainboard are not caught between the transformer and the rear panel.

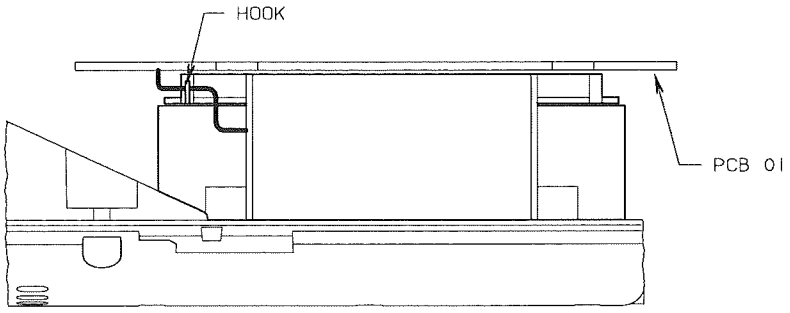
Mounting the speakers

The individual speaker units overlap, so in order to be able to mount the individual units the baffle with the tweeter has to be mounted first and then the woofer units.

The cable shoes must be tight and pressed into place.

Replacement of thermal fuse

The thermal fuse, TF1, must be placed in the same way as the defective fuse. Make sure the supply leads run under the hook of the transformer.



Repair procedure proposal

THE SPEAKER IS SILENT, RED LIGHT IN THE LED.

Check the following:

- The fuses F1 and F2, PCB01 (must be removed when measured).
- The voltage at the emitter of TR9-PCB03, must be approx. 16.5V.
- The $\pm 8.6V_B$ supply voltage.
- If $\pm 8.6V_B$ is present, check TR10-PCB01.
- If $\pm 8.6V_B$ is not present, check TR1 and TR15 on PCB03.
- Is the switch in a position different from that being tested?

THE SPEAKER IS NOT SILENT, RED LIGHT IN THE LED.

Check $V_{re\text{-}on}$, the voltage at the collector of TR10-PCB03. It must be less than 0.5V.

THE SPEAKER IS SILENT, GREEN LIGHT IN THE LED.

Check the following:

- Is the switch in the right position?
- The fuses F1 and F2, PCB01 (must be removed when measured).
- The fuse resistor R26-PCB03.
- The $\pm 35V$ supply voltage.
- The $\pm 8.6V_A$ supply voltage.
- The $\pm 8.6V_B$ supply voltage.
- The voltage across C20-PCB03; it should be approx. 18V.
- The voltage at pin 7 of IC3-PCB03; it should be approx. -34V.
- The voltage at the base of the mute transistors TR2-PCB03 and TR5-PCB03 should be approx. -2V.

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EINSTELLUNG

Einstellung des Tiefen-/Höhenpegels

Nach Austausch eines Lautsprechers ist der Pegel einzustellen. Auf der Rückseite der neuen Lautsprechereinheit ist ein in dB angegebener Wert gedruckt.

Dieser Wert ist im Zusammenhang mit der Einstellung zu benutzen.

Es ist nicht notwendig, daß die Lautsprechereinheiten während des Einstellvorgangs angeschlossen sind.

1. Tongenerator anschließen – entweder an:

   - Anschluß 5 (Umschalter in Stellung RIGHT) der POWER LINK-Buchse.
     Am Anschluß 4 müssen +5 V anliegen

     oder

   - Anschluß 3 (Umschalter in Stellung LEFT) der POWER LINK-Buchse.
     Am Anschluß 4 müssen +5 V anliegen

     oder

   - PHONO-Buchse (Umschalter in Stellung PHONO)

   Signalpegel
   Zum Einstellen der Hochton-Einheit ist ein Signal von 10 kHz – 100 mV zuzuführen.

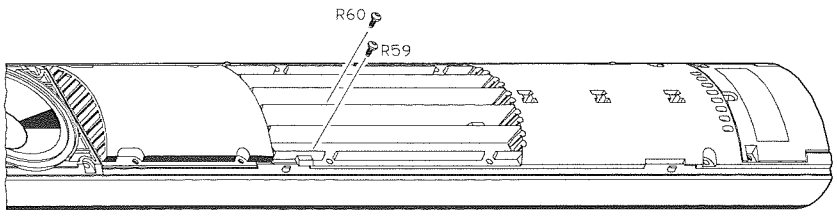
   Zum Einstellen der Tiefton-Einheit ist ein Signal von 1 kHz – 100 mV zuzuführen.

2. AC-Voltmeter über die Anschlußklemmen der ausgetauschten Einheit anschließen

   Hochton-Einheit: P6-1/P6-3

   Tiefton-Einheit: P6-4/P6-5

3. Je nach dem auf der neuen Einheit angegebenen Wert ist mit R60 PCB03 (Höhen) oder R59 PCB03 (Tiefen) einzustellen.
   R59 und R60 werden durch Entfernung der Schrauben zugänglich – siehe Abbildung.



Einstellung Hochtonpegel

Zum Einstellen der Hochton-Einheit wird auf die Spannung abgeglichen, die dem angegebenen dB-Wert entspricht.

Einstellung Tieftonpegel

Zum Einstellen von 1 Tiefton-Einheit wird auf die Hälfte des auf der neuen Lautsprechereinheit angegebenen Wertes abgeglichen.

- Beispiel: Bei einer Wertangabe von -1,5 dB, wird auf die Spannung eingestellt, die -0,75 dB (3,27 V) entspricht.

Zum Einstellen von 2 Tiefton-Einheiten werden die beiden Wertangaben addiert und danach durch 2 geteilt.

- Beispiel: Bei Wertangaben von -1,5 dB und 2 dB ergibt sich ein Gesamtwert von 0,5 dB, und es wird auf eine Spannung eingestellt, die einem Wert von 0,25 dB (2,72 V) entspricht.

Austausch von PCB03

Nach Austausch von PCB03 ist der Pegel des Hochton-Lautsprechers mit R60-PCB03 auf 3,00 V einzustellen. Der Pegel des Tiefton-Lautsprechers ist mit R59-PCB03 auf 2,80 V einzustellen.

Wert in dB	Hochtöner	Tieftöner
2,00	2,38 V	2,22 V
1,75	2,45 V	2,29 V
1,50	2,52 V	2,36 V
1,25	2,60 V	2,42 V
1,00	2,67 V	2,50 V
0,75	2,75 V	2,57 V
0,50	2,83 V	2,64 V
0,25	2,91 V	2,72 V
0,00	3,00 V	2,80 V
-0,25	3,09 V	2,88 V
-0,50	3,18 V	2,97 V
-0,75	3,27 V	3,05 V
-1,00	3,37 V	3,14 V
-1,25	3,46 V	3,23 V
-1,50	3,53 V	3,33 V
-1,75	3,67 V	3,42 V
-2,00	3,78 V	3,52 V

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REPARATURTIPS

Wichtiger Hinweis!

Die Ladeelektrolyten C5-PCB03 und C6-PCB03 sind zur Vermeidung von Folgeschäden mit einem Leistungswiderstand von ca. 500 Ohm zu entladen. Diese Ladeelektrolyten entladen sich nämlich nicht – weder in Stand-by noch nach Entfernen der Netzspannung (die Spannung kann sich bis zu einer Woche halten).

Stromversorgung

Die einzelnen 8,6 V-Versorgungen sind in verschiedenen Situationen aktiv.

$\pm$8,6 V_B sind in Stand-by ausgeschaltet.

$\pm$8,6 V_C sind nur dann eingeschaltet, wenn der Umschalter S1 in Stellung PHONO steht.

Autostart-Schaltkreis

Ca. 0,8 Sekunden, nachdem ein Signal (ca. 100 µV) auf die PHONO-Buchse gelangt, schaltet sich das Gerät in den Modus ON.

Wenn der Autostart-Schaltkreis nicht ausgeschaltet wird, schaltet sich das Gerät ca. 2 Minuten, nachdem das Signal an der PHONO-Buchse verschwunden ist, in Stand-by.

Falls bei einer Reparatur der Autostart-Schaltkreis auszuschalten ist, kann dies durch Kurzschließen des C43-PCB03 erfolgen.

Schutzschaltkreis

Der Schutzschaltkreis (TR6, TR7 und TR10) PCB03 kann kontrolliert werden, wenn der Widerstand zwischen P2-1 und P2-2 (NTC-Widerstand) <22kOhm gemacht wird. Hierzu muß das Gerät in Stand-by stehen.
Das Gerät läßt sich nur aus diesem Zustand herausbringen, wenn die Netzversorgung entfernt wird.

ABL (Adaptive Bass Linearization)

Die ABL-Funktion läßt sich am einfachsten kontrollieren, wenn ein Tongenerator (80 Hz) an die Eingangssteckbuchse angeschlossen wird.

DC-Voltmeter über R238-PCB04 anschließen.
Pegel am Tongenerator so einstellen, daß die Spannung über R238-PCB04 gerade von 0 V anzusteigen beginnt; die Spannung muß zwischen 0-30 mV liegen. Dadurch wird der ABL-Kreis gerade aktiv sein. (Die Ausgangsleistung beträgt ca. 11 W).

Pegel am Eingang jetzt um 10 dB erhöhen.

Die Spannung über R238-PCB04 muß jetzt sofort auf ca. 2,2 V ansteigen. (Die Ausgangsleistung beträgt ca. 24 W).

Pegel am Eingang jetzt um 10 dB absenken.

Nach Verlauf von 5-10 Sekunden muß die Spannung über R238-PCB04 auf ca. 0 V abfallen. Der ABL-Kreis ist außer Funktion.

Zusammenbau des Gerätes

Es ist besonders darauf zu achten, daß die Leitungen von der Transformator-/Power Link PCB zur Hauptplatine (Mainboard) nicht zwischen Transformator und Rückwandteil eingeklemmt werden.

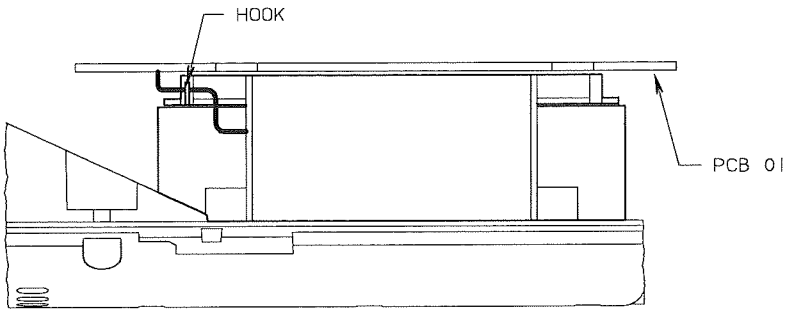
Einbau der Lautsprecher

Die einzelnen Lautsprechereinheiten verdecken zum Teil einander. Zur Montage der einzelnen Einheiten ist es deshalb notwendig, zuerst die 'Baffle'-Platte mit der Hochtoneinheit und danach die Tieftoneinheiten zu montieren.

Die Kabelschuhe müssen einwandfreien Kontakt aufweisen und ganz aufgeschoben werden.

Austausch der Thermosicherung

Die Thermosicherung TF1 ist auf dieselbe Art und Weise wie die fehlerhafte Sicherung anzubringen. Es ist wichtig, daß die Zuleitungen unter den Haken des Transformators zu liegen kommen.



Vorschlag zum Reparaturverfahren

DER LAUTSPRECHER IST TOT, DIE LEUCHTDIODE LEUCHTET ROT.

Es sind die folgenden Punkte zu kontrollieren:

- Sicherungen F1 und F2, PCB01 (sie müssen zum Messen herausgenommen werden).
- Spannung am Emitter des TR9-PCB03; sie muß bei ca. 16,5 V liegen.
- Versorgungsspannung $\pm 8{,}6\ V_B$.
- Sind $\pm 8{,}6\ V_B$ vorhanden, so ist TR10-PCB01 zu kontrollieren.
- Sind $\pm 8{,}6\ V_B$ nicht vorhanden, so sind TR1 und TR15 PCB03 zu kontrollieren.
- Steht der Umschalter in anderen Stellung als der, in der getestet wird?

DER LAUTSPRECHER IST NICHT TOT, DIE LEUCHTDIODE LEUCHTET ROT

$V_{re\text{-}on}$-Spannung am Kollektor des TR10-PCB03 kontrollieren; sie muß unter 0,5 V sein.

DER LAUTSPRECHER IST TOT, DIE LEUCHTDIODE LEUCHTET GRÜN.

Es sind die folgenden Punkte zu kontrollieren:

- Steht der Umschalter korrekt?
- Sicherungen F1 und F2, PCB01 (sie müssen zum Messen herausgenommen werden).
- Sicherungswiderstand R26-PCB03.
- Versorgungsspannung ± 35 V.
- Versorgungsspannung $\pm 8{,}6\ V_A$.
- Versorgungsspannung $\pm 8{,}6\ V_B$.
- Spannung über C20-PCB03; sie muß bei ca. 18 V liegen.
- Spannung am Anschluß des IC3-PCB03; sie muß bei ca. -34 V liegen.
- Die Spannung an der Basis der 'Mute'-Transistoren TR2 PCB03 und TR5 PCB03 muß bei ca. -2 V liegen.

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REGLAGE

Réglage du niveau des graves et des aigus

Il convient de régler le niveau lors du remplacement du haut-parleur. La face arrière du nouveau haut-parleur présente une valeur indiquée en dB.

Il convient de prendre cette valeur pour le réglage.

Il n'est pas nécessaire de raccorder les haut-parleurs pour procéder au réglage.

1. Raccorder un oscillateur à basse fréquence

   - à la borne 5 (sélecteur en position RIGHT) de la fiche POWER LINK (la borne 4 doit afficher une tension de +5 V),
   - à la borne 3 (sélecteur en position LEFT) de la fiche POWER LINK (la borne 4 doit afficher une tension de +5 V)

     ou

   - à la fiche PHONO (sélecteur en position PHONO).

   Niveaux du signal

   Pour régler le haut-parleur d'aigu, appliquer un signal de 10 kHz – 100 mV.

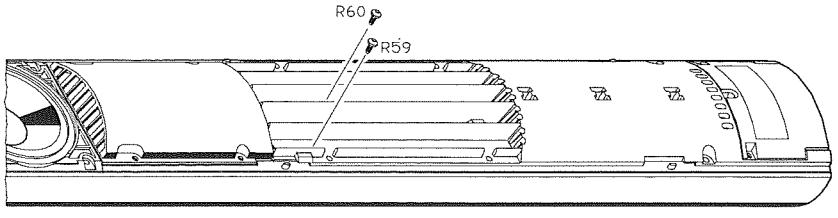
   Pour régler le haut-parleur de grave, appliquer un signal de 1 kHz – 100 mV.

2. Raccorder un voltmètre ca au travers des bornes de connexion du haut-parleur remplacé.

   Aigus : P6-1 / P6-3

   Graves : P6-4 / P6-5

3. Régler avec R60-PCB03 (aigus) ou R59-PCB03 (graves) selon la valeur indiquée sur le nouveau haut-parleur.
   Pour accéder à R59 et R60, enlever les vis comme montré à la illustration.



Réglage du niveau des aigus

Pour modifier le niveau des aigus, régler pour obtenir la tension correspondant à l'indication en dB.

Réglage du niveau des graves

Pour le réglage d'une section grave, adopter une valeur correspondant à la moitié de celle indiquée sur le nouveau haut-parleur.

- Ex. : Régler pour obtenir une tension correspondant à-0,75 dB (3,27 V) si la valeur indiquée est de -1,5 dB.

En présence de 2 sections grave, ajouter les 2 valeurs et diviser le résultat par 2.

- Ex. : Les valeurs indiquées sont de -1,5 et de 2 dB. La somme donne 0,5 dB. Il convient de régler pour obtenir une tension correspondant à 0,25 dB (2,72 V).

Remplacement de la carte PCB03

Lors de cette opération, régler le haut-parleur d'aigu sur 3,00 V en agissant sur R60-PCB03. Régler le haut-parleur de grave sur 2,80 V à l'aide de R59-PCB03.

Indication en dB	Aigus	Grave
2,00	2,38 V	2,22 V
1,75	2,45 V	2,29 V
1,50	2,52 V	2,36 V
1,25	2,60 V	2,42 V
1,00	2,67 V	2,50 V
0,75	2,75 V	2.57 V
0,50	2,83 V	2,64 V
0,25	2,91 V	2,72 V
0,00	3,00 V	2,80 V
-0,25	3,09 V	2,88 V
-0,50	3,18 V	2,97 V
-0,75	3,27 V	3,05 V
-1,00	3,37 V	3,14 V
-1,25	3,46 V	3,23 V
-1,50	3,53 V	3,33 V
-1,75	3,67 V	3,42 V
-2.00	3,78 V	3,52 V

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CONSEILS DE REPARATION

Attention !

Décharger les condensateurs électrolytiques C5-PCB03 et C6-PCB03 avec une résistance effective de 500Ω env. avant de remplacer les composants. Cette mesure vise à éviter tout endommagement éventuel. En effet, ces condensateurs électrolytiques ne se déchargent pas, ni en mode veille, ni en coupant l'alimentation secteur (la tension peut subsister durant une semaine).

Alimentation électrique

Les diverses alimentations 8,6 V sont actives dans différents cas.

$\pm$8,6 V_B est coupée en mode veille.

$\pm$8,6 V_C est uniquement en service quand le sélecteur S1 est en mode PHONO.

Circuit de mise en marche automatique

L'appareil se met en marche 0,8 seconde env. après avoir appliqué un signal (100 µV env.) à la douille phono.

L'appareil commute en mode "veille" 2 minutes env. après que la douille phono ne reçoit plus de signal si le circuit de mise en marche automatique n'est pas coupé.

Court-circuiter C43-PCB03 pour couper le circuit de mise en marche automatique lors d'une intervention.

Circuit de protection

Il est possible de contrôler le bon fonctionnement du circuit de protection (TR6, TR7 et TR10) de la carte PCB03 en attribuant à la résistance intercalée entre P2-1 et P2-2 (résistance CTN) une valeur inférieure à 22 kΩ. L'appareil commute alors en mode veille. L'appareil ne peut quitter cet état qu'en coupant l'alimentation secteur.

ABL (linéarisation adaptative des graves)

Raccorder un oscillateur à basse fréquence (80 Hz) à la fiche d'entrée pour contrôler facilement la fonction ABL.

Raccorder un voltmètre cc au travers de R238-PCB04.

Régler le niveau de l'oscillateur à basse fréquence jusqu'à ce que la tension traversant R238-PCB04 commence à s'écarter de la valeur 0 V. La tension doit être comprise entre 0 et 30 mV. Dans cette plage, la fonction ABL est active (puissance approximative de sortie : 11 W).

Augmenter le niveau de l'entrée de 10 dB.

La tension traversant R238-PCB04 monte immédiatement à 2,2 V env. (puissance approximative de sortie : 24 W).

Atténuer le niveau de l'entrée de 10 dB.

Au bout de 5 à 10 secondes, la tension traversant R238-PCB04 doit retomber à 0 V env. La fonction ABL est coupée.

Montage de l'appareil

Veiller à ce que les câbles reliant la carte Transformateur/Power Link et la carte principale ne se coincent pas entre le transformateur et la face arrière.

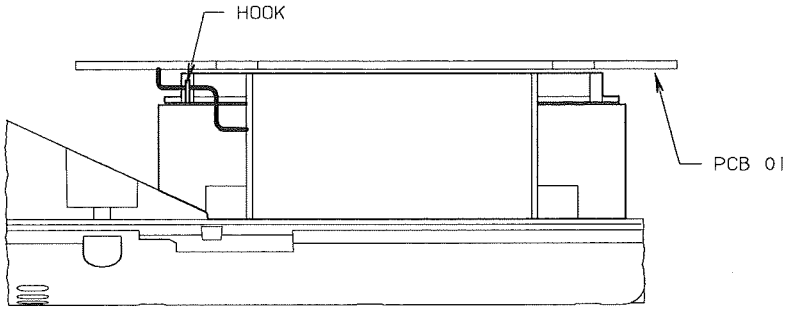
Montage des haut-parleurs

Les diverses sections sont superposées. Pour les monter, il est impératif de commencer par l'écran des aigus et de terminer par les haut-parleurs de grave.

Les cosses des câbles doivent être serrées et présenter un excellent contact.

Remplacement du fusible thermostatique

Il convient de placer le fusible thermostatique neuf TF1 dans la même position que le fusible grillé. Il est capital que les câbles passent sous le crochet du transformateur.



Mode opératoire proposé pour la réparation

HAUT-PARLEUR MUET, DIODE ELECTROLUMINESCENTE ROUGE

Contrôler les points suivants :

- Fusibles F1 et F2 de PCB01 (les sortir pour les mesurer).
- Tension de l'émetteur de TR9-PCB03. Elle doit avoisiner 16,5 V.
- Tension d'alimentation ±8,6 V_B.
- TR10-PCB01 en présence de ±8,6 V_B.
- TR1 et TR15-PCB03 en l'absence de 8,6 VB.
- Position du sélecteur. Vérifier qu'il n'est pas dans une position autre que celle qui est applicable aux tests.

HAUT-PARLEUR ACTIF, DIODE ELECTROLUMINESCENTE ROUGE

Contrôler la tension $V_{re\text{-}on}$ du collecteur de TR10-PCB03. Elle doit être inférieure à 0,5 V.

HAUT-PARLEUR MUET, DIODE ELECTROLUMINESCENTE VERTE

Contrôler les points suivants :

- Position du sélecteur. Est-elle correcte ?
- Fusibles F1 et F2 de PCB01 (les sortir pour les mesurer).
- Résistance de sécurité R26-PCB03.
- Tension d'alimentation ±35 V.
- Tension d'alimentation ±8,6 V_A.
- Tension d'alimentation ±8,6 V_B.
- Tension traversant C20-PCB03. Elle doit avoisiner 18 V.
- Tension à la borne 7 de IC3-PCB03. Elle doit avoisiner -34 V.
- Tension à la base des transistors de coupure du son TR2-PCB03 et TR5-PCB03. Elle doit avoisiner -2 V.

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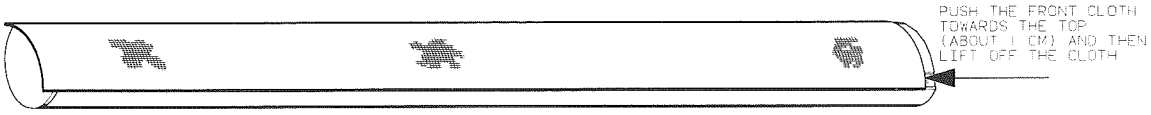
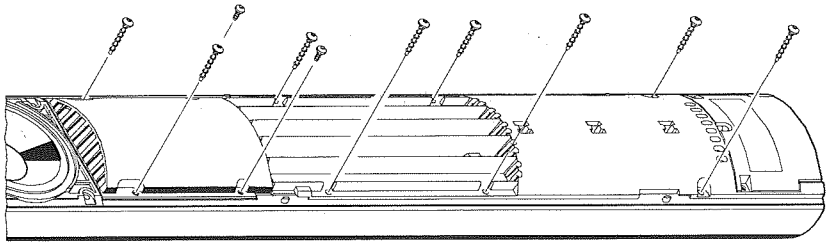
DISASSEMBLY **ZERLEGUNG** **DESASSEMBLAGE**

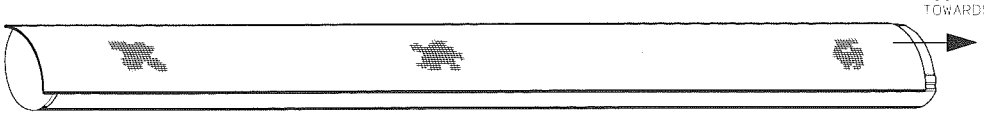
DISMOUNTING OF THE FRONT CLOTH



DISMOUNTING OF THE HEAT SINK



MOUNTING OF THE FRONT CLOTH



INSULATION TEST

Each set must be insulation tested after having been dismantled. Make the test when the set has been reassembled and is ready to be returned to the customer.

Flashovers must not occur during the testing procedure!

Make the insulation test as follows:

Short-circuit the two pins of the mains plug and connect them to one of the terminals of the insulation tester. Connect the other terminal to ground in phono socket (LINE IN).

NOTE!
To avoid damaging the set it is essential that both terminals of the insulation tester have good contact.

Slowly turn the voltage control of the insulation tester until a voltage of 1.5-2 kV is obtained. Maintain that voltage for one second, then slowly turn it down again.

ISOLATIONSPRÜFUNG

Nach einer Zerlegung ist an jedem Gerät eine Isolationsprüfung vorzunehmen. Die Prüfung ist erst dann durchzuführen, wenn das Gerät wieder vollständig zusammengebaut und zur Ausgabe an den Kunden bereit ist.

Während der Prüfung dürfen zu keinem Zeitpunkt Überschläge vorkommen.

Die Isolationsprüfung ist wie folgt durchzuführen:

Die beiden Steckerstifte des Netzsteckers kurzschließen und an den einen der beiden Eingänge des Isolationsprüfgeräts anschließen. Den anderen Eingang des Isolationsprüfgeräts an die Masse der Phonobuchse (LINE IN) anschließen.

ACHTUNG!
Um Beschädigungen des Gerätes zu vermeiden, ist es wichtig, daß die beiden Eingänge des Isolationsprüfgerätes einen einwandfreien mechanischen Kontakt aufweisen.

Jetzt den Spannungsregler des Isolationsprüfgerätes langsam hinaufdrehen, bis eine Spannung von 1,5-2 kV erreicht wird. Diese Spannung ist 1 Sekunde lang aufrechtzuerhalten, wonach der Spannungsregler wieder langsam zurückgedreht wird.

TEST D'ISOLEMENT

Il convient de vérifier le bon isolement de chaque appareil qui a été désassemblé. Le test s'effectue après avoir remonté l'appareil et avant de le remettre au client.

Le test ne doit pas faire apparaître de contournement!

Procéder au test comme suit:

Court-circuiter les deux broches de la fiche secteur. Les raccorder à l'une des bornes du testeur d'isolement. Raccorder la seconde borne à la masse de la douille phono (LINE IN).

Attention!
Pour éviter tout endommagement de l'appareil, il est capital de s'assurer que les deux bornes du testeur d'isolement ait un contact irréprochable.

Tourner lentement le régulateur de tension du testeur jusqu'à obtenir une tension de 1,5 à 2 kV. Maintenir cette valeur durant une seconde, puis réduire progressivement la tension.

BeoLab 6000

Type 6821, 6822, 6823, 6824, 6825

PCB7 Power supply and amplifier

PCB8 Crossover network

From serial no. : 13252520

Service Manual

3538899 12-98

Paste into Service Manual BeoLab 6000 (3538816)
In Serviceanleiting BeoLab 6000 (3538816) einkleben
A coller le Manual d'entretien pour BeoLab 6000 (3538816)

BANG & OLUFSEN

DIAGRAM E FOR CROSSOVER NETWORK

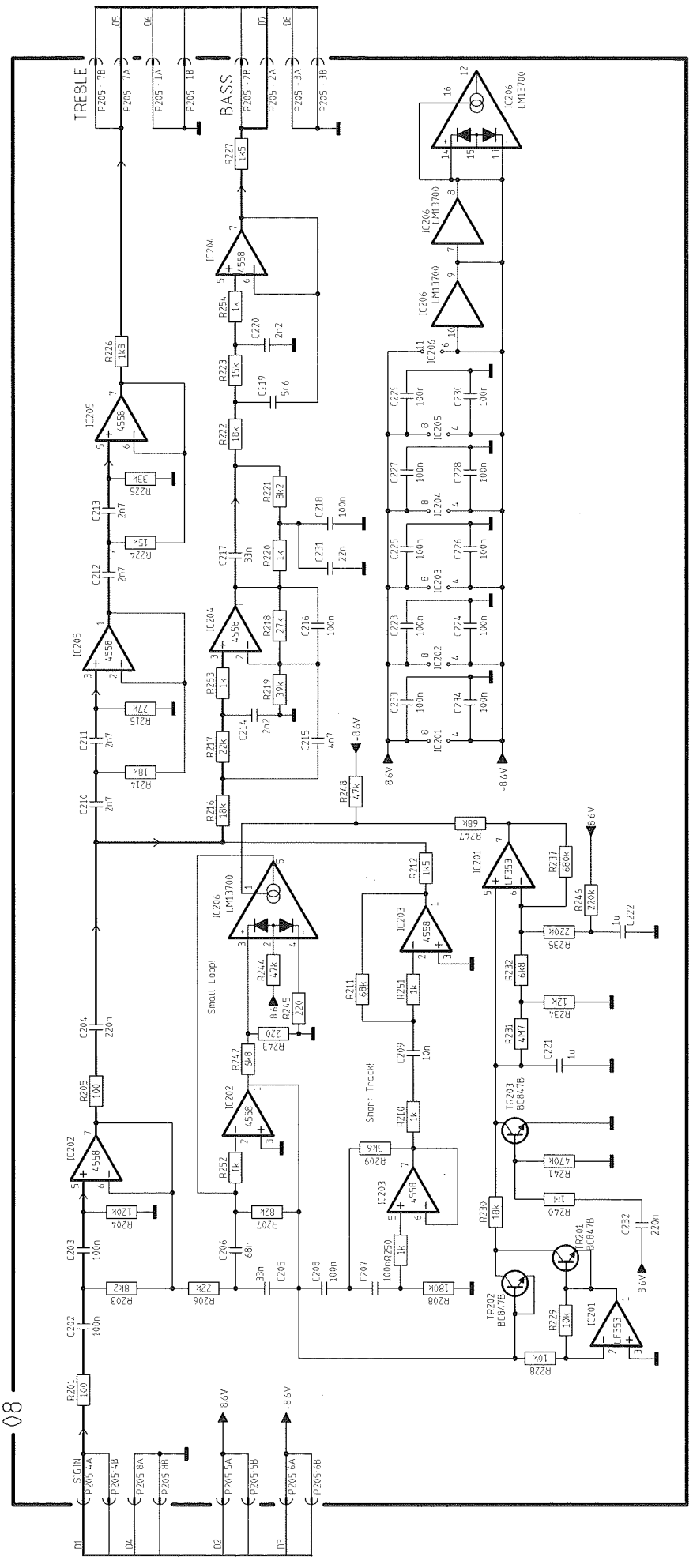
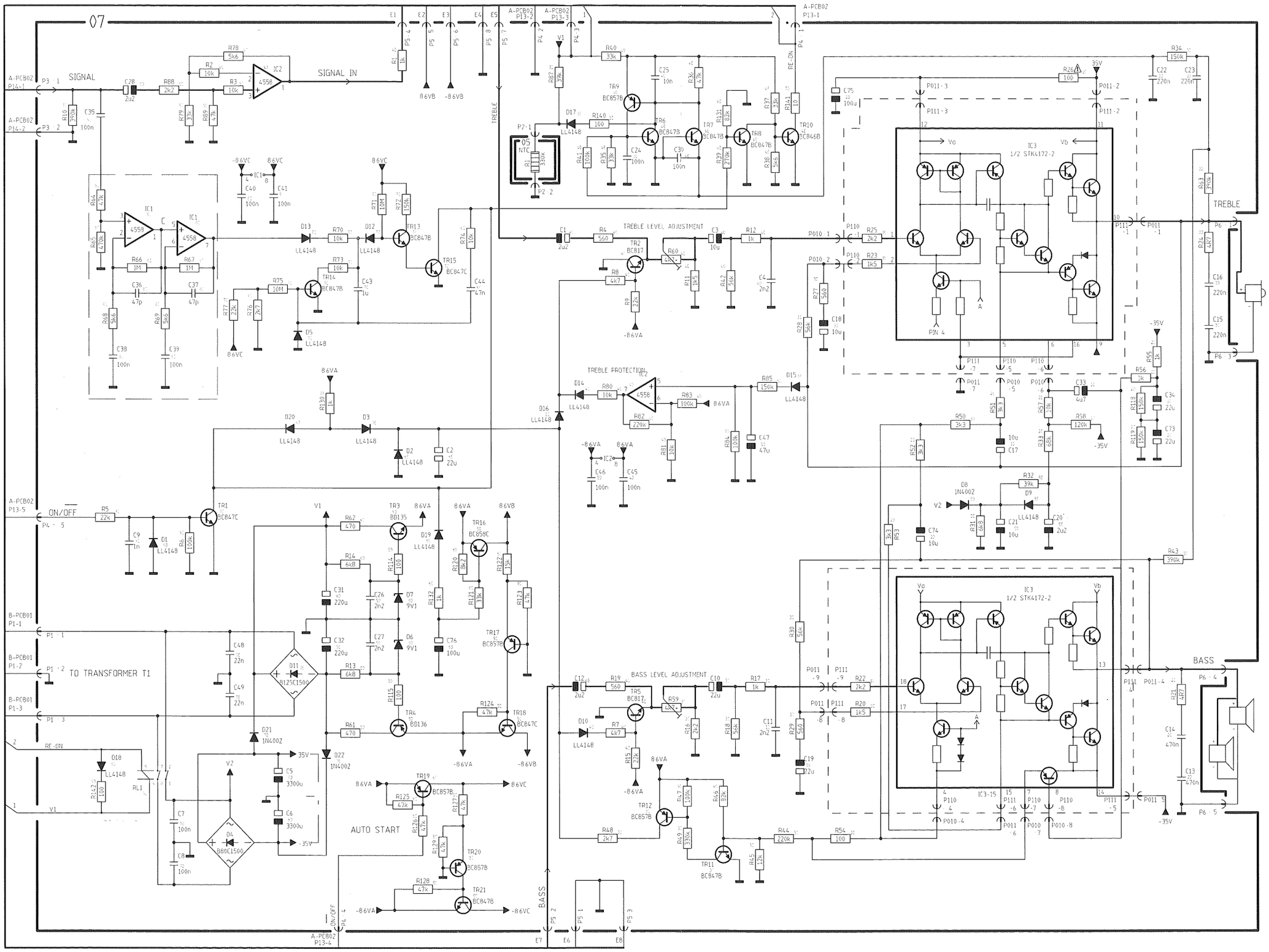
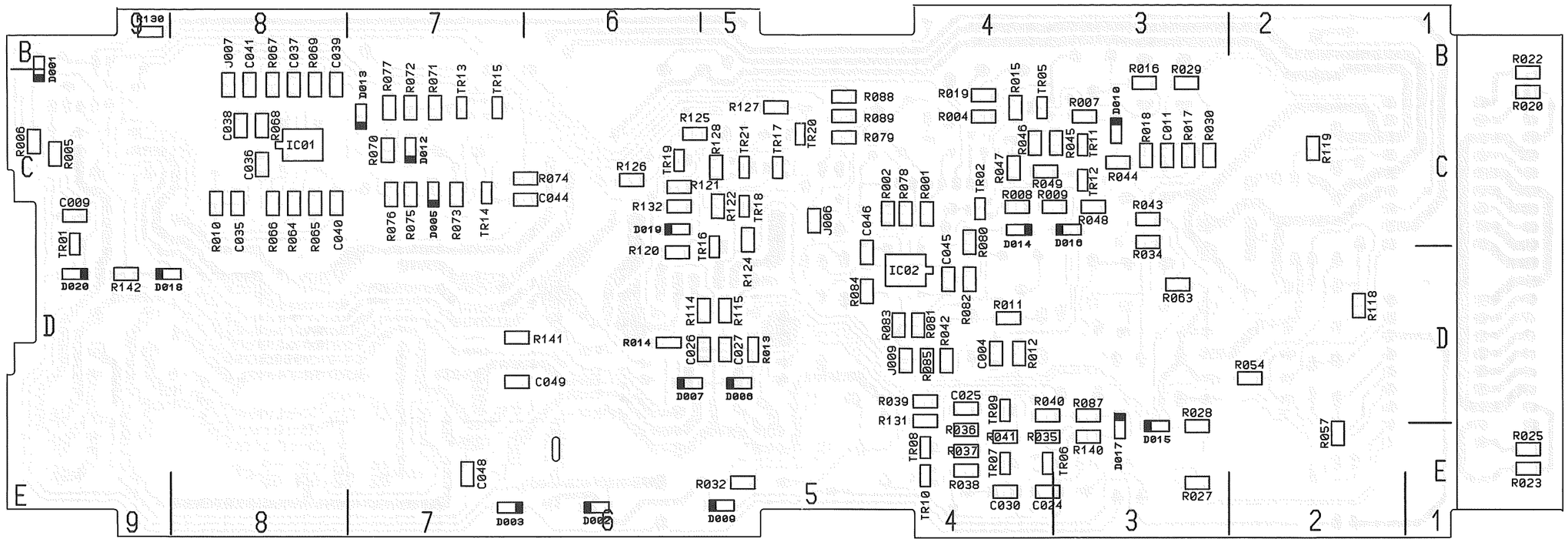


DIAGRAM D FOR POWER SUPPLY AND AMPLIFIER

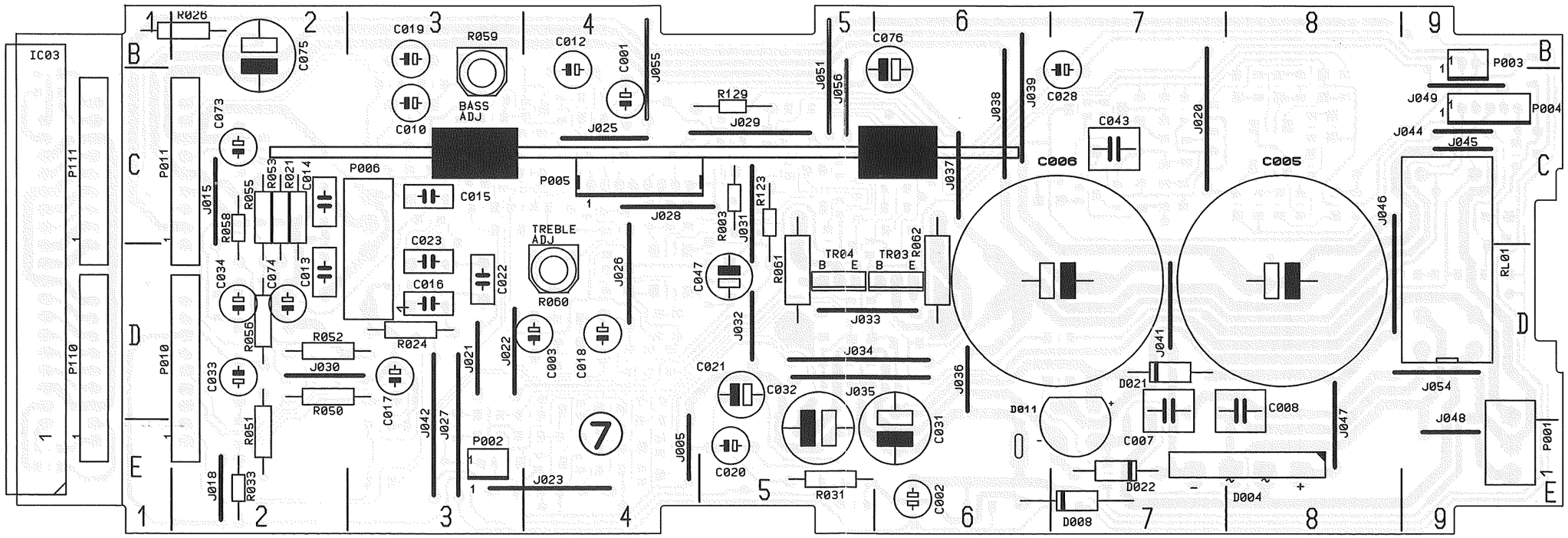


16-3 PCB DRAWING

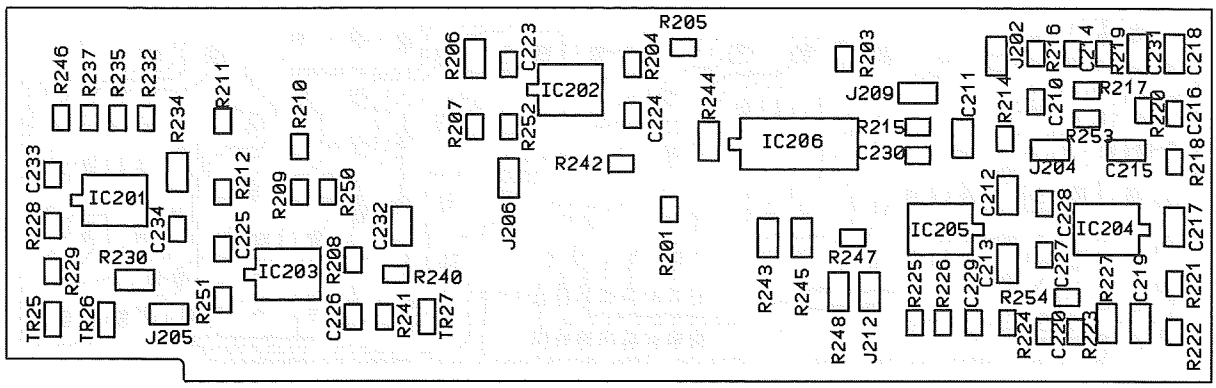
PCB7, POWER SUPPLY AND AMPLIFIER (from secondary side)



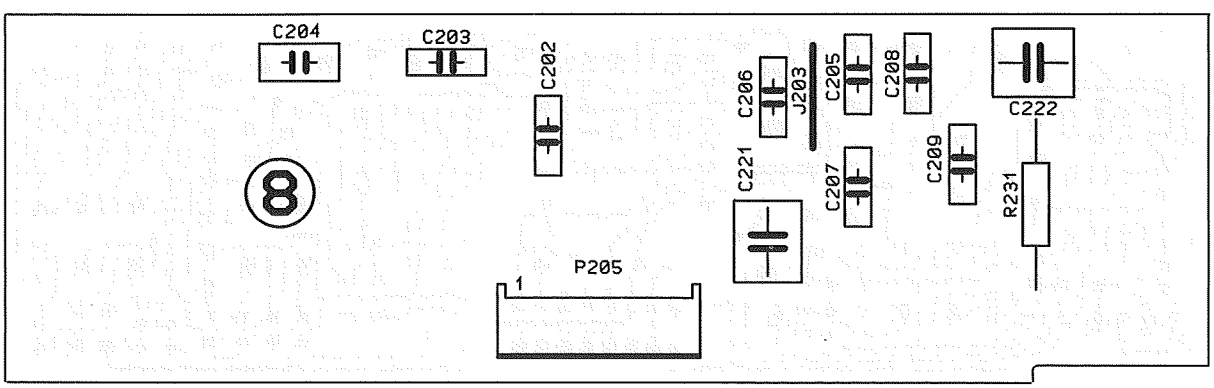
PCB7, POWER SUPPLY AND AMPLIFIER (from primary side)



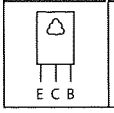
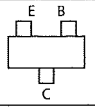
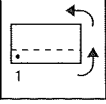
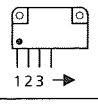
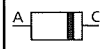
PCB8, CROSSOVER NETWORK (from secondary side)



PCB8, CROSSOVER NETWORK (from primary side)



LIST OF ELECTRICAL PARTS

32	51	138	141	209	250		
							

Resistors not referred to are standard, see page 16-7.
All other parts are identical with the service Manual 3538816 section 1 to 7.

PCB7, 8006077 Power supply and amplifier

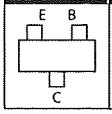
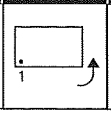
IC1-IC2Δ	8341022	**138**	4558	IC3	8350091	**141**	Hybrid STK4172-2

TR1	8320936	**51**	BC847C	TR13-TR14	8320755	**51**	BC847B
TR2	8320752	**51**	BC817-40	TR15	8320936	**51**	BC847C
TR3*	8320239	**32**	BD135	TR16	8320778	**51**	BC858C
TR4*	8320240	**32**	BD136	TR17	8320811	**51**	BC857B
TR5	8320752	**51**	BC817-40	TR18	8320936	**51**	BC847C
TR6-TR8	8320755	**51**	BC847B	TR19-TR20	8320811	**51**	BC857B
TR9	8320811	**51**	BC857B	TR21	8320755	**51**	BC847B
TR10	8320816	**51**	BC846B				
TR11	8320755	**51**	BC847B				
TR12	8320811	**51**	BC857B				

D1-D3	8300482	**250**	LL4148	D9-D10	8300482	**250**	LL4148
D4	8300497		KBU 6D	D11	8300466		125V 1.5A
D5	8300482	**250**	LL4148	D12-D20	8300482	**250**	LL4148
D6-D7	8300762	**250**	Z9.1V 2%	D21-D22	8300023	**209**	1N 4002
D8	8300023	**209**	1N 4002				

R13-R14	5012192	6.8kΩ 5% 1/4W	R59-R60	5370370	4.7kΩ 30% 0.1W
R21	5010765	4.7Ω 1% 1/2W	R61-R62	5021605	470Ω 5% 1W
R24	5010765	4.7Ω 1% 1/2W	R81	5011241	10kΩ 5% 1/8W
R26	5020159	100Ω 10% 0.3W	R82	5011261	220kΩ 5% 1/8W
R31	5011042	6.8kΩ 1% 1/2W	R130	5011631	1kΩ 1% 1/4W
R50-R53	5011037	3.3kΩ 1% 1/2W			
R55-R56	5011028	1kΩ 1% 1/2W			

C1	4200517	2.2µF 20% 50V	C24	4010166	100nF -20+80% 50V
C2	4200672	22µF 20% 16V	C25	4010176	10nF -20+80% 50V
C3	4200510	10µF 20% 16v	C26-C27	4010170	2.2nF 10% 50V
C4	4010170	2.2nF 10% 50V	C28	4200517	2.2µF 20% 50V
C5-C6	4201139	3300µF 20% 50V	C30	4010166	100nF -20+80% 50V
C7-C8	4130103	100nF 20% 250V	C31-C32	4200858	220µF 20% 50V
C9	4000345	1.0nF 5% 50V	C33	4200875	4.7µF 20% 100V
C10	4200525	22µF 20% 10V	C34	4200508	22µF 20% 25V
C11	4010170	2.2nF 10% 50V	C35	4010220	100nF 10% 50V
C12	4200517	2.2µF 20% 16V	C36-C37	4000234	47pF 5% 50V
C13-C14	4130234	470nF 10% 63V	C38-C39	4010220	100nF 10% 50V
C15-C16	4130233	220nF 20% 63V	C40-C41	4010166	100nF -20+80% 50V
C17	4200561	10µF 20% 50V	C43	4130070	1µF 10% 50V
C18	4200510	10µF 20% 16V	C44	4010209	47nF 10% 50V
C19	4200508	22µF 20% 25V	C45-	4010166	100nF -20+80% 50V
C20	4200517	2.2µF 20% 50V			

51	151						
							

Resistors not referred to are standard, see page 16-7.
All other parts are identical with the service Manual 3538816 section 1 to 7.

C48-C49	4010216	22nF 10% 100V	C74	4200561	10µF 20% 50V
			C75	4201309	100µF 20% 63V
C73	4200508	22µF 20% 25V	C76	4200628	100µF 20% 16V
RL1	7600110	Relay 36V			
P1	7220185	Plug 3 pole	P4	7220712	Plug 5 pole
P2-P3	7220709	Plug 2 pole	P5	7220788	Plug 8 pole
			P6	7220206	Plug 5/4 pole

Parts not shown

P10-P11	7229142	Holder wire 9 pole	P110-P111	7229142	Holder wire 9 pole

PCB8, 8006076 Crossover network

IC201Δ	8341033	**151** LF353	IC206Δ	8341411	**151** LM13700
IC202-IC205Δ	8341022	**151** 4558			
TR201-TR203	8320755	**51** BC847B			
R231	5010770	4.7MΩ 1% 1/2W			
C202-C203	4130306	100µF 10% 63V	C216	4010274	100nF -20+80% 25V
			C217	4010175	33nF 10% 50V
C204	4130308	220nF 10% 63V	C218	4010220	100nF 10% 50V
C205	4130305	33nF 10% 63V	C219	4001157	5.6nF 5% 50V
C206	4130231	68nF 10% 63V	C220	4000442	2.2nF 5% 50V
C207-C208	4130306	100nF 10% 63V	C221-C222	4130070	1µF 10% 50V
C209	4130265	10nF 10% 63V	C223-C230	4010274	100nF -20+80% 25V
C210	4001148	2.7nF 5% 50V			
C211-C213	4010195	2.7nF 55 50V	C231	4010216	22nF 10% 100V
			C232	4000287	22nF -20+80% 25V
C214	4000442	2.2nF 5% 50V	C233-C234	4010274	100nF -20+80% 25V
C215	4001098	4.7nF 5% 50V			
P205	7210768	Socket 8 pole			
J60-J61	6200279	Wire flat 80 mm 9 pol.			

Δ indicates that static electricity may destroy the component.

Standard resistors

Resistors 5% 1/4 W

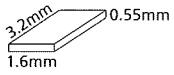
	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0	5010592	5010506	5010065	5010040	5010059	5010049	5010054	5010638
1.2		5010595	5010128	5010153	5010046	5010047	5010665	
1.5	5011348	5010468	5010057	5010247	5010053	5010063	5010093	
1.8		5010822	5010362	5010066	5010135	5010072	5010791	
2.2	5010682	5010448	5010092	5010064	5010079	5010120	5010245	
2.7	5010925	5010403	5010000	5010298	5010141	5010083	5010431	
3.3	5011860	5010253	5010044	5010076	5010075	5010117	5010848	
3.9	5011377	5010622	5010070	5010069	5010060	5010073	5010714	
4.7	5010888	5010411	5010058	5010048	5010045	5010077	5011513	
5.6	5010706	5010151	5010067	5010041	5010061	5010071	5010658	
6.8	5010874	5010039	5010144	5010052	5010062	5010074		
8.2	5010880	5010056	5010068	5010154	5010091	5010505		

Resistors 5% 1/8 W

	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0		5011464	5011357	5010816	5010935	5011440	5011459	5020875
1.2		5011351	5011084	5011442	5011338	5011341	5011175	
1.5		5011463	5011443	5011178	5011364	5011398	5011460	
1.8			5011350	5011361	5011344	5011468		
2.2	5011032	5011376	5010886	5011353	5010833	5011369	5011342	
2.7		5011471	5011355	5011362	5011366	5011370	5011478	
3.3		5011519	5011337	5010827	5011346	5011371	5011462	
3.9		5011438	5011883	5011157	5011457	5011372	5020876	
4.7		5011038	5011441	5011363	5010937	5011343	5011611	
5.6		5011412	5011358	5010885	5011166	5011340		
6.8		5011356	5011336	5010839	5011367	5011458		
8.2		5011466	5011354	5011339	5011368	5011373		

Resistors SMD 2% 1/8 W
SMD 5% 1/8 W

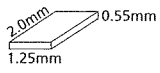
Glue dots, approx. 200, part no. 3181932



	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
1.0	5011623	5011647	5011218	5011227	5011241	5011256	5011267	5011730
1.1	5011624	5011648	5011669	5011681	5011689	5011694	5011707	
1.2	5011625	5011649	5011219	5011682	5011490	5011257	5011708	
1.3	5011626	5011650	5011670	5011683	5011242	5011258	5011709	
1.5	5011627	5011651	5011220	5011228	5011243	5011259	5011710	
1.6	5011628	5011652	5011671	5011684	5011690	5011695	5011711	
1.8	5011629	5011653	5011672	5011229	5011244	5011260	5011712	
2.0	5011630	5011654	5011673	5011685	5011691	5011696	5011713	
2.2	5011216	5011655	5011674	5011230	5011245	5011261	5011714	
2.4	5011634	5011656	5011675	5011686	5011246	5011697	5011715	
2.7	5011635	5011657	5011497	5011231	5011247	5011262	5011716	
3.0	5011731	5011658	5011499	5011500	5011692	5011698	5011717	
3.3	5011217	5011659	5011676	5011232	5011248	5011263	5011718	
3.6	5011636	5011660	5011677	5011687	5011249	5011264	5011719	
3.9	5011637	5011661	5011221	5011233	5011491	5011699	5011720	
4.3	5011638	5011662	5011498	5011688	5011492	5011700	5011721	
4.7	5011639	5011269	5011222	5011234	5011250	5011265	5011722	
5.1	5011640	5011663	5011678	5011235	5011493	5011701	5011723	
5.6	5011641	5011664	5011223	5011236	5011251	5011702	5011724	
6.2	5011642	5011665	5011224	5011237	5011693	5011703	5011725	
6.8	5011643	5011666	5011225	5011238	5011252	5011704	5011726	
7.5	5011644	5011667	5011679	5011239	5011253	5011705	5011727	
8.2	5011645	5011270	5011226	5011240	5011254	5011266	5011728	
9.1	5011646	5011668	5011680	5011489	5011255	5011706	5011729	

Resistors SMD 5% 1/10 W

Glue dots, approx. 200, part no. 3181932



	x1	x10	x100	x1k	x10k	x100k	x1M	x10M
0.0	6000072							
1.0		5011920	5011932	5011944	5011956	5011968	5011980	5012275
1.2	5012326	5011921	5011933	5011945	5011957	5011969	5012267	
1.5	5012379	5011922	5011934	5011946	5011958	5011970	5012268	
1.8	5012380	5011923	5011935	5011947	5011959	5011971	5011989	
2.2		5011924	5011936	5011948	5011960	5011972	5012220	
2.7		5011925	5011937	5011949	5011961	5011973	5012269	
3.3		5011926	5011938	5011950	5011962	5011974	5012261	
3.9		5011927	5011939	5011951	5011963	5011975	5012270	
4.7	5012472	5011928	5011940	5011952	5011964	5011976	5012271	
5.6		5011929	5011941	5011953	5011965	5011977	5012272	
6.8		5011930	5011942	5011954	5011966	5011978	5012273	
8.2		5011931	5011943	5011955	5011967	5011979	5012274	